COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Spacious new portion of Atlantic City's convention center is seen during one of the first exhibitions held there. The facility will hold an estimated 30,000 attendees at next week's Spring Joint Computer Conference, which starts Tuesday. Entire exhibit area will be on Boardwalk level for the first time since the "joints" became the major computer attraction in the nation.

Varied Sessions at Spring Joint Expand Social, Business Themes

By a CW Staff Writer

ATLANTIC CITY, N.J. – There are several reasons next week's Spring Joint Computer Conference is expected to be one of the most successful ever, but none of these reasons seems to come from the exhibit floor.

Many people believe the economy has turned a corner, and that belief will be put to a test when the show opens its three-day stint Tuesday morning in the newly expanded Convention Hall.

The conference theme, "Responsibility," will be reflected in such technical sessions as those devoted to ecology, law enforcement and responsible government. The general economy, business environment and state of the art will also be included in these sessions.

Some of the top names in the computer community will participate in the technical portion, although they will not be on the exhibit floor. Even so, the conference sponsors are predicting a marked upturn in attendance from last year's 22,000 plus.

SJCC Coverage Begins on Page 27

The number of exhibitors has decreased from last year's 300 to 188, with booth space going from 900 to about 625, according to the sponsors, the American Federation of Information Processing Societies (Afips).

Major manufacturers who opted for other showcases for their equipment include IBM, Honeywell, Univac and Control Data Corp.

Burroughs and NCR will be there, but won't be showing DP equipment. RCA will demonstrate the RCA 3 operating in a "simulated remote computing environment." But despite the absence of companies which normally buy space in huge lots, the average booth size has not de-

(Continued on Page 2)

'Wired City' by 1975, Developer Predicts

By Edward J. Bride
CW Staff Writer

SEEKONK, Mass. – The principles of shared software, distributed data processing, CATV and computer-assisted instruction will combine to form the "wired city" by 1975, according to industry and user reports from a recent conference here.

Two Univac experts on the speakers' platform agreed with a Sanders' Associates official on the likelihood of a wired city, but predicted it wouldn't occur until 1980.

The technology is already available, according to Robert F. Smythe, a wired-city proponent and developer with Sanders Associates of Nashua, N.H.

He told a meeting of the Association for Systems Management that the "nation one day will all be cabled, [giving] access to knowledge and computing power for everyone who can afford a TV set."

Univac's Dr. Carl Hammer said it might take government money to underwrite such a project, and that his company had looked at some of the wired-city principles as much as 20 years ago, without performing any cost/performance evaluations.

Smythe stated cheap $1,500 programmable CRT terminals are in the foreseeable future, "given the economics of mass production."

Communication Solutions

Education in the home, by using a standard television and dial or Touch-Tone telephone, is a logical extension, once "the problem of communications" is solved. He also had some ideas on solving those problems.

The twisted pair switched circuits of AT&T were never meant for digital transmissions, Smythe explained, adding his research found microwave and other over-the-air techniques severely limited in bandwidth and susceptible to the environment.

The coaxial cable amounts to "a beautiful digital pipe," he announced, which theoretically could move data at the rate of 13 million bits per second, per 6MHz video channel.

He further explained that, while the practical figures are lower, CATV cable can be installed at $5,000 to $6,000 per mile, with the available bandwidth equivalent to 60,000 three kilocycle phone lines.

What this portends is a "major impact on not only educational users, but to EDP users everywhere," Smythe declared, "even-

(Continued on Page 2)

Bankers' Show Told

Businesses Not Security-Conscious

By Edward J. Bride
CW Staff Writer

NEW YORK – The destruction or extended outage of one computer could put a business *out* of business permanently, but few companies realize this or are taking steps to mitigate the effects of such an occurrence, security sources report.

The sparse turnout of some 60 persons at a security session during last week's Automation Conference sponsored by the American Bankers' Association (ABA) seemed to indicate that even bankers are ignoring the possibility of such disasters.

The show drew about 1,500 people, several hundred more than preliminary estimates. The 60 exhibitors included several mainframe manufacturers who will not be showing computer equipment at the Spring Joint Computer Conference, among them IBM, Control Data Corp., Honeywell and Burroughs.

Only half the attendees at the security session had taken or are developing formal disaster-recovery plans for their DP operations. The theme of the conference, "Managing Change," was approached from many angles, and the social changes which have brought civil violence were but one of these angles.

By embracing too much change "all at once," IBM caused a "painful experience for us and for our customers," during the transition to System 360, an IBM executive admitted.

George Beitzel, vice-president and general manager of IBM's Data Processing Group, said the manufacturer suffered "a loss in customer satisfaction" by unexpected programming problems and delivery delays.

"The plain fact was that by embracing too much change we couldn't keep our word," he told the keynote audience.

The lesson, Beitzel remarked, is that "even though you consider yourself in the business of change, there is still a strong inclination to disbelieve the change you are going through – to underestimate the strong thrust of technology, the power of an idea whose time has come."

Regarding the future of computer usage, he noted there is "no longer a question" of whether major businesses will use computers. "The only question is how computers will be used," he remarked.

Beitzel predicted that by the end of the decade consumers will interact directly with the banks' computers in "all routine transactions," and that a "major breakthrough" will occur when

(Continued on Page 2)

IBM Displaces 2260

WHITE PLAINS, N.Y. – IBM last week announced a CRT, terminal system which offers 2260 users an upgrade with more features at half the cost. The new 3270, IBM's lowest priced full alphanumeric CRT, also offers such options as an improved hard-copy printer and 1,920 character display.

The 3270 is available either as a stand-alone unit with built-in controller, or as a multidisplay system with controller and up to 32 terminals. It can be attached to a 360 or 370 multiplexer or selector channel either directly or via telephone line.

The terminals are available with either 480 or 1,920 character display capacities, with the latter offering twice the capacity of previous IBM alphanumeric displays. All system components are buffered.

Three keyboards are offered, up to 12 special keys can perform programmed functions, and a light pen is optional. Serial printers, at 40 and 66 char/sec, can be included. The 3270 operates in binary synchronous mode.

The monthly rental for a system including twelve 1,920-character stations and control will be $1,900, with a price of $71,000.

The stand-alone display, including built-in controller, has a rental price of $135 for the 480 and $160 for the 1,920 character models. Prices are $6,100 and $7,100. Rental prices for the 40 char/sec printer will be $140/mo. Shipments are scheduled for second quarter 1972.

On the Inside

Squad Car Terminal Speeds Communications – *Page 5*

Core Memory Seen Outdistancing Semi – *Page 49*

Communications 22
Computer Industry 49
Editorial 10
Education 14
Financial 54
Societies 17
Software/Services 19
Systems/Peripherals ...23

Business Called Disaster-Prone

(Continued from Page 1)

cash-dispensing machines go on-line.

Predictions were generally bleak regarding another social change, the "checkless society," although it appears computers will aid in reducing much paperwork for the banking community, including the elimination of some checks.

The ABA Monetary and Payments System (Maps) planning committee released the findings of a three-year study, concluding paper checks will continue to serve as a basic method of payments transfer.

There are nonetheless "compelling reasons" for bankers to seek the advantages of "paperless" debiting and crediting, the Maps committee added. In this way, banking can lay the foundation for a variety of new customer services on a nationwide basis that will be available only through electronic payments transfer.

Richard P. Cooley, chairman of the Maps committee and president of the Wells Fargo Bank in San Francisco, urged his colleagues to plan now "for an automated method to supplement the paper check system."

The key to banking's success in addressing future markets is the "early identification of customer needs and wants," he stated.

One result of a computerized payments system would be a significant reduction of the monetary "float," the amount of funds in transit between banks and their customers. The Maps committee anticipated this would have relatively little impact on the total credit available from the banking system.

There was considerable user interest in NCR's banking terminals, and Burroughs, which had by far the largest booth, also emphasized its "total commitment to banking."

No fewer than five companies exhibited voice response units. Interest in the progress of this technology was evidenced by two separate television stations, which produced special segments for Monday evening news shows, heralding the arrival of the voice response feature.

One speaker predicted the use of COM would double in the banking community this year, which may not be difficult to achieve since only about 120 banks use the technique now.

Edward Forrest, of Seaco Computer Display, Inc., said retrieval on a CRT system can cost $50 to $100 for "real-time" data, while for $1 a microfilm retrieval terminal can give "real-enough-time" information, without the problems of power brownouts.

Boston Attorney Roy N. Freed told the users that, in drafting computer contracts, their language should be "neither computerese nor legalese," which can confuse and "elude the understanding of a judge, if not all others."

Freed said a contract should serve "much as the equivalent of a program to guide the people . . . providing answers to questions that might arise." This suggests that "practically all the understandings reached in negotiation be reduced to writing," he cautioned.

The four-day affair at the Americana Hotel drew users from 44 states and 18 countries, plus Washington, D.C., and Puerto Rico.

Outages Rated a Leading Cause

NEW YORK – Power failures have become the leading "equipment-type" cause of computer problems, second only to human error, according to Robert V. Jacobson, president of Bradford Security Systems, Inc.

At a security session during the American Bankers' Association conference here last week, Jacobson elicited the following descending order of occurrence for computer troubles:

Human Error; power failures and brownouts; hardware failure; flooding; civil disorder and fire.

Harold Weiss, director of the Automation Training Center, added "conversion fiascos" as the major source of long-range difficulties. He noted the human error or power problems usually are not as costly as conversion troubles.

★Notice to Subscribers★

Over the past few weeks *Computerworld* has been experiencing delivery problems in major metropolitan areas throughout the country.

Until the advent of Amtrak May 1, CW relied heavily on passenger train mail dispatch for more than 80% of subscription copies. This service has now been virtually abolished. In its place, Amtrak offers regular freight service to the West Coast and special piggyback service to the East.

The new rail service has forced major systems adjustments on CW's circulation and distribution departments, as well as on the U.S. Post Office. This conversion probably will continue to cause delays in deliveries over the next few weeks. The Post Office is working to eliminate these delays as soon as possible.

In the meantime, if you experience any extraordinary delays in the delivery of your paper, please send your most recent address label directly to the Circulation Manager, Computerworld, 797 Washington St., Newton, Mass., 02160. Upon receipt, CW will initiate Post Office tracing procedures.

RCA Hikes Rental Prices On Spectra, 2d Generation

By Frank Piasta
CW Staff Writer

MARLBORO, Mass. – RCA users leasing either Spectra or any of the company's second generation systems will face rental increases on Aug. 1.

The price increases on the RCA 301, 501, 601 and 3301 will amount to 3%, while those on the Spectra Series will be 5%.

The company's RCA 2, 3, 6 and 7 computers will not be affected by the price increase, RCA said. All currently available peripherals for use with the newer series CPUs will be included in the 5% price increase.

The company further stated that the price boosts will uniformly affect unbundled as well as bundled RCA installations.

The price increases can be interpreted as a still further attempt by RCA to urge its users away from second and third generation hardware in favor of the newer systems. The RCA 2, 3, 6 and 7 already display a significant price/performance advantage over the Spectras, and the new price increase will widen the gap.

The rental hikes with no corresponding increase in purchase price, might also make the systems more attractive to third-party lessors, and encourage leasing customers to purchase systems.

The RCA increase seems surprising in view of the recent announcement of the IBM 360/22, which offers the power of the 360/30 at about one-third the CPU cost.

Manufacturers other than IBM were asked for their reaction to the RCA increases, but all had no comment.

One spokesman, however, noted that IBM would feel the greatest impact of the RCA maneuver since RCA equipment is directly comparable to the 360 series.

'Wired City' Predicted

(Continued from Page 1)

tually to your home and mine."

Hammer, Univac's director of Computer Sciences, and Dr. Paul Oliver, the company's graphics display expert, nodded approval as Smythe explained what Hammer called the "circulating memory" theory.

Out of a disk file, Smythe suggested, "we continuously broadcast the contents of that disk over a coaxial cable" at a one- to six-Mbit/sec channel rate, keeping the data moving past a community of users.

Bonanza or Data?

With modems, users with programmable display terminals can access that data stream "as easily as tuning Bonanza on a TV set," Smythe stated.

The data could be pages of text from a file, instruction for students, pay records or even the white pages of a telephone directory.

The programmable display, having loaded the information into its memory, goes essentially off line, allowing the user to manipulate that data however he sees fit, Smythe went on. "Remember, the display terminal has its own microprocessor, you can load it from the data stream down the cable," he suggested.

By using local cassettes or disk memories, personal files can be maintained in conjunction with files distributed on the cable, he revealed, and the data could be returned either on the same cable via a loop, with two-way amplifiers, or with phone lines.

"Yes, phone lines. The data rate that people are able to generate can nicely be handled by twisted pairs," he concluded.

A discussion period following the speakers centered around CAI, mostly at the suggestion of the Rev. George McGregor, of Providence College, the conference's chairman. Hammer stated the theme by noting CAI as known today is "horrible drudgery."

He said the computer could be used to reduce students' time in the classroom, since they could go home and interact with the TV set. When he suggested the government might be interested in underwriting the proliferation of wired cities, Smythe said he had been visiting large-city mayors to promote the idea of selling cable franchises.

As far as improving CAI, most of the speakers agreed the teacher can play as influential a role as the programmer or manufacturer. The idea of CAI is to enhance the role of the teacher, making the computer the "information dispenser."

Variety of Sessions Flavors Spring Joint

(Continued from Page 1)

clined considerably.

Afips' optimism may also stem from the attractiveness for the business user in the technical program, which will include six sessions on "topics of prime interest to business management," the association pointed out.

"Optimum Computer Usage"

Chairman of the technical program, Dr. Nathaniel Macon noted since computers are playing an increasing role in today's economy, "more and more businessmen find themselves in need of increased information relating to the optimum use of EDP systems and personnel."

The business sessions include:

- Computer acquisition: purchase or lease?
- Computers in transport: for management needs or suppliers' delight?
- The computer professional and the changing job market.
- Competitive evaluation of interactive systems.
- An international view.

World View

This last session will be chaired by Dr. Carl Hammer, director of Univac's computer program. The session is intended to explore the impact which EDP systems have had upon the sciences, engineering, economy and government of Japan, the UK, the Soviet Union and the U.S.

The conference will actually begin on an international note with Sir John Wall, chairman of International Computers, Ltd., "England's IBM," as keynote speaker.

Worker's Viewpoint, Too

There will be an attempt by a group of unemployed computer workers to counterbalance the emphasis on the employment session, which looks at management's personnel requirements.

The session will look at unemployment from the workers' viewpoint, and is one of five being conducted by Computer People for Peace (CPP) under joint sponsorship with Afips.

The other sessions will include an examination of computer data banks ("the right to be un-listed"), computers as used by the military (the electronic battlefield), minority groups and women in the industry and health systems.

Preregistration figures were expected to set a record, Afips related, but it will be difficult to assess their impact because last Spring's first-time preregistration was hampered by a mail strike, and last fall's conference was being held for the first time in the Southwest.

Nonetheless, the totals were running ahead of both the last two shows, giving Afips additional cause for optimism.

There could be another reason for increased totals because the number of free passes the exhibitors are given is based strictly on booth size, and as some of the historically large exhibitors won't be there, computer users may have lost the "contact" for a free pass. They could thus have decided to pay their way rather than miss the show, and save money by paying their way in advance.

Either way, the SJCC is being appropriately billed as the world's largest gathering of computer specialists and users.

Afips has reinstituted an exhibits-only fee, $10, to beef up attendance. Full registration, to include the technical sessions, costs $30 for members of any of Afips' constituent societies, $60 for nonmembers. Students and military personnel may register for $5.

Paid registration will take place in the "old" Convention Hall, as usual. Exhibitors and their guests will register and enter from the boardwalk through an area between the old hall and the new facility.

Besides the technical program and exhibition area, conference activities include the Thursday luncheon, with featured speaker Sen. Sam J. Ervin Jr. (D-N.C.), who conducted the investigation into government spying and computerized data banks.

Ervin's chief counsel, Lawrence M. Baskir, will address a Tuesday evening meeting of ACM's Special Interest Committee on Computers and Society. The meeting is intended to appraise and discuss the hearings.

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Rural MD of the Future–Part II

Melting Pot Creates 'Assistant'

By Thomas J. Morton
CW Midwest Bureau

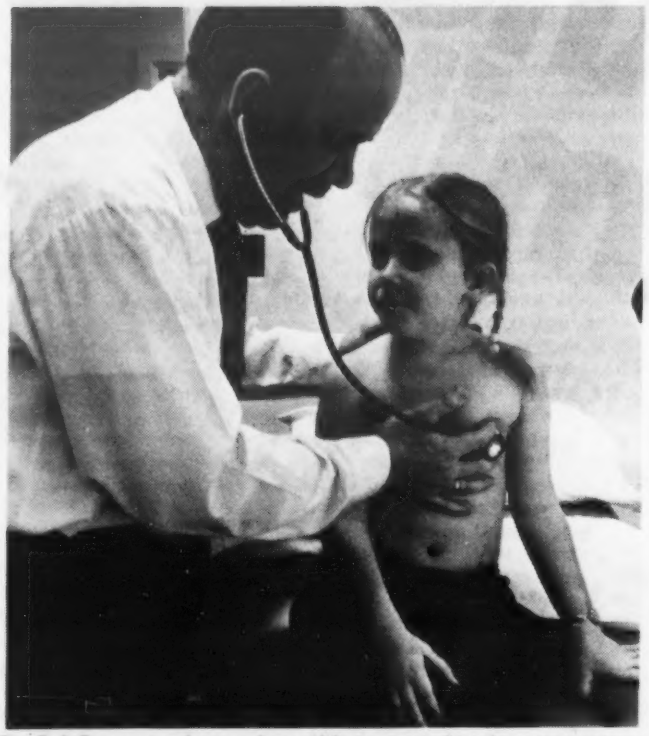
SALEM, Mo. – A trend is developing in the industry: more successful systems are being brought forth by a cooperative multidiscipline interaction.

That is exactly what happened in this tiny Missouri town, and because of it a rural general practitioner has all the analytical and consultational facilities of a major medical center right in his own office.

A mix of electrical engineers, industrial engineers, physicians, psychologists, commercial artists, systems engineers and systems designers, management consultants, experts from IBM, experts on governmental funding and people from the involved government agencies all got together to develop a prototype operation that computerizes a grand old American tradition: the country, family doctor.

With the birth of the idea, named Automated Physician's Assistant (APA), came the realization of all the troubles the mixed team was suddenly facing.

Here was an idea that proposed the use of the very latest in DP technology, hardware and software, by people who were totally uninitiated in computer technology.



Dr. B.J. Bass, a rural general practitioner, says that the computer can become as important to the physician as the stethescope or any of his other tools. (CW photo)

Here was a plan that recommended the installation of DP peripheral equipment in the doctor's office already bursting its bounds with the equipment of his own profession.

Here was a design that incorporated data transmission through the facilities of three distinctly separate telephone companies.

Here was a system that was required to be absolutely error-free, because of the kind of vital information it would handle, while it was being operated, a greater part of the time, by people who wouldn't have the vaguest idea of what they were doing.

Not many of those involved gave the idea very good odds on becoming a reality.

But the system is up and running, with the very latest in hardware and software, in a crowded doctor's office, connected through three different telephone companies over a distance of over 130 miles.

In a pilot project of the Missouri Regional Medical Program (Mormp), one of the first four such Health, Education and Welfare programs to become operational, the first item on the agenda, according to Dr. Warren P. Sights of the Mormp operations office, was to find first an area that was completely remote from a major medical facility and second a doctor competent enough to appreciate what the proposed system could offer him and his patients.

"Unfortunately," Sights said, "it is not difficult to find an area without proper medical facilities, even today, but finding that doctor was somewhat more difficult."

They found both. Salem is a small town of about 4,500 people, deep in the Ozark foothills of the lead mining area of Missouri. "Anyway you want to go," one of the townspeople told CW, "it's a hundred miles or more to a big town (Columbia, St. Louis, or Springfield)."

The doctor was B.J. Bass, a Missourian, but a "newcomer" to Salem (he's been in town for only 15 years) who has been able to win both the confidence and the hearts of his neighbors. Bass wanted the APA project, because, he says, he saw what it would offer his patients.

"He wanted it so bad," said Dr. Earl Simmons, executive secretary of the advanced technology program, "he joined us . . . on his own time . . . and fought harder than any of us, I guess, to make sure it got working."

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Merger Takes Aim at Brownouts

BLOOMFIELD, Conn. – The prevention of electrical blackouts and brownouts is apparently the ultimate purpose of a merger between Datalight, Inc., an electronics firm based here, and Waters Associates Power Systems Division, of Framingham, Mass.

Datalight, a subsidiary of Andersen Laboratories, said it planned to use computers in "a new role" in electric power generating stations: extending the life of steam generators and preventing breakdowns and power shortages by detecting and monitoring the presence of contaminants in the feedwater.

Electronic controls and computers will be used to "automatically achieve closer monitoring and correction," a Datalight spokesman noted.

The Waters Associates Division has designed and developed equipment for advanced installations, including nuclear plants.

Datalight is a producer of laser beam control and scanning equipment for several fields, including data processing.

News Wrapup

Detective Sentenced for Selling Data

NEW YORK – A former police detective was sentenced to 90 days in jail and fined $5,000 for selling confidential police information – primarily arrest records – to banks and airlines who wanted information on prospective employees.

Included in the sold data was information from New York State's computerized criminal history file. The policeman did not tap the computer directly, but instead stole data from manual files which contained data taken legitimately from the computers.

Michael Martin, a policeman for 24 years, pleaded guilty in January to receiving $6,590 for the data.

Official Hits Computer Wastage in UK

LONDON – The managing director of a London management consultant firm here believes that computer wastage in the UK may be similar to that in the U.S.

"Our experience in the UK suggests," said R.H. Coleman of the American-based A.T. Kearney firm, "that if we did a similar study here the result would generally coincide with our survey in the U.S. There is undoubtedly a great deal of computer wastage in Britain, he said.

The American survey covered 155 computers used by 89 small, medium and large organizations engaged in commerce and industry.

Of total available machine hours, the average computer in the survey performed productive work only 48% of the time.

Information Processing Journal Published

AMSTERDAM, The Netherlands – The first issue of *Information Processing Letters* will contribute to the exchange of information in this field by the rapid publication of properly referenced, short articles.

The journal aims to allow rapid dissemination of interesting results in the field of information processing in the form of short concise papers not exceeding 2,000 words. These will center around system architecture and application programs and include topics such as theoretical aspects of computer and systems programming and problems of hardware design connected with software production.

One of the features of the journal will be the publication of "Research Reports on Current Work." These will enable readers to learn about projects while the work on them is still under way.

Initially issues will be published in alternate months and six issues will form a volume costing $25. Free examination copies will be sent on request by Elsevier/North-Holland, Journal Division, P.O. Box 211, Amsterdam, The Netherlands.

British to End Computer-Compiled Phonebooks

LONDON – Bowing to public criticism, the British Post Office has withdrawn computer-compiled phone books which do not list all names alphabetically. The system listed subscribers in alphabetical order up to their surnames and the first letter of their given names, and then listed by alphabetical order of the street on which they lived.

The books, already issued in 14 of Britain's 60 telephone areas, aroused a storm of criticism among users. A Post Office spokesman said no more of the books would be published or issued, and that the computer will be reprogrammed to the old style listing.

Alaska 50th State to Hook Into NCIC Net

ANCHORAGE, Alaska – State troopers here have hooked onto the FBI's National Crime Information Center network making this the fiftieth state to have access to the network. Information on stolen property and fugitives is stored in a data bank in Washington, D.C. The first time the Alaska hookup was used, a man, stopped on a routine traffic check, was arrested when the computer revealed he was wanted in another state.

House to Consider Results of Brooks Bill

WASHINGTON, D.C. – The House Subcommittee on Government Activities, chaired by Rep. Jack Brooks (D-Tex.), will hold hearings May 19 on the successes and failures of the five-year-old Brooks Bill, which established procedures in the Federal Government for the management of automatic data processing.

Witnesses from the Office of Management and Budget, General Services Administration, National Bureau of Standards and voluntary standards people outside the government are expected to testify.

Common Sense Binds IBM's Business Attire

ARMONK, N.Y. – White, buttoned down shirts will *not* be mandatory for IBM employees, the firm said, in spite of a recent memo from Thomas J. Watson Jr. charging that "too many of our employees are beginning to exceed the bounds of common sense in their business attire."

Colored shirts and modern suits are a threat that "could eventually affect the performance of the corporation in an adverse way," the memo stated.

In addition, Watson called on regional managers to make sure that any employee that "a potential customer might casually observe" was dressed "appropriately."

IBM spokesmen said the memo reflected a "sane position," and that the firm was not instituting any "specific" dress code, unlike many other firms.

The Sylvania electronic system enables a patrol officer to transmit and receive descriptive and numerical data on crimes, accidents and other incidents with a video terminal in the squad car. The Sylvania/Digicom 300 system consists of mobile (above) and base station terminals, each of which includes a keyboard for typing messages and a CRT display.

Squad Car Terminal Speeds Police Communications Net

By Edward J. Bride
CW Staff Writer

WASHINGTON, D.C. – A video terminal designed for on-line access to computerized police information has been successfully demonstrated from police squad cars here.

Designed to reduce channel crowding on existing police voice networks, the maker claims the unit can handle 100 data transmissions in the same time for one voice message.

The unit is just one of a series of portable police-type units developed by GTE Sylvania's Sociosystems Laboratories (SSL) in Mountain View, Calif. Portions of the system have been tested in various police jurisdictions nationwide.

For the three-day metropolitan Washington demonstration, typed messages were simulated

A police dispatcher uses a special keyboard and display console to send and receive precoded messages.

to check on wanted persons and stolen cars, and relayed over the voice network in coded tone signals that did not interfere with verbal messages, Sylvania disclosed.

Designated Digicom 300, the unit places the man/machine interface in the squad car, instead of requiring the patrolling policeman to radio his message to a dispatcher, for transmission to any of the several police computer systems (local, state or FBI).

The system consists of mobile and base station terminals, each of which includes a keyboard and a CRT display. After typing the message (up to 64 characters), the dispatcher or patrol officer presses a button to transmit the message in seconds.

The unit also enables the officer to transmit by push-button the status codes, preselected messages and an emergency alert that he requires assistance.

Digicom 300 communicates directly with minicomputers which act as buffers to the police systems such as the National Crime Information Center (NCIC).

Earlier this year, according to Sylvania, a New York test proved the unit could be used "wherever a voice channel is available," including on bridges and in tunnels.

Digicon 300 can be used strictly as a communications extension of police computers, or as a component in a larger automatic dispatching system known as Respond (Rapid Electronic System for Police Operations and Dispatching).

This overall package has been tested in several areas on both coasts, and was demonstrated for the International Association of Chiefs of Police (IACP) at a convention last year.

Sylvania noted the Respond system, too, is controlled by a minicomputer; all city streets are stored in a disk pack. The system uses a Hewlett-Packard 2115 or 2116, Data General Nova or Tempo 1, according to Sylvania, which plans to extend the capability to be conversant with other small computers.

The inclusion of Digicom 300 into Respond "goes a long way toward providing a completely automated dispatch system," according to a company representative.

SSL has developed other terminal-type equipment for police or public usage, such as the Digimap 100 which automatically relays status and location of vehicles to a dispatcher.

The map system is a pressure-sensitive map mounted on a grid-matrix board within "easy reach of the driver," Sylvania stated. The unit is connected directly to a Digicom terminal which transmits coordinate data from the digimap to the base station when the operator presses his "location" on the grid.

The semiautomatic system requires less than a second of air-time to relay the data to a dispatcher of the Respond computer, Sylvania reported.

Round-the-Clock Center

Federal Agencies Know Where to Go for DP Service

By Alan Drattell
CW Washington Bureau

WASHINGTON, D.C. – A data center that doesn't make any money and that provides automatic data processing services "cafeteria style" to federal agencies is operating out of a subterranean complex in the Department of Agriculture building here.

Called the Washington Data Processing Center (WDPC) and located two floors beneath street level, the facility is administered by Agriculture's Statistical Reporting Service. It was set up in 1962 and began operations with an IBM 650.

"We operate 100% under reimbursables; we bill for whatever we provide for our customers," explained Raymond J. Long, WDPC director. And customers include other federal agencies in addition to Agriculture.

Brooks Bill

Under the Brooks Bill, the public law which established the pattern and profile of the Federal Government's ADP operation, any unused time on federal systems is made available to other agencies. About 25% of WDPC's round-the-clock, seven-day-a-week operation is sold to agencies outside Agriculture.

"We run about $4.2 million a year in income," said Long. "We have a zero balanced budget, and our prices compare favorably with data centers outside the government. We have to base our rates on cost; this is a requirement of the General Accounting Office."

By most standards, WDPC is a large operation with a staff of 100 operators, programmers, systems analysts, production control people, secretaries, clerks and others.

The facility houses an IBM System 360/40 which it owns outright and a 65 which it rents.

The 360/65 has 16 tape drives, 1 million bytes of core, two printers, three 2314s, two 2311s, a 2250 CRT and 4 million bytes on a 2301 drum.

The 360/40 has seven tape drives, 256K core, ten 2311s and a printer. There is transmission control on both computers, and one of the 2314s is shared by both systems.

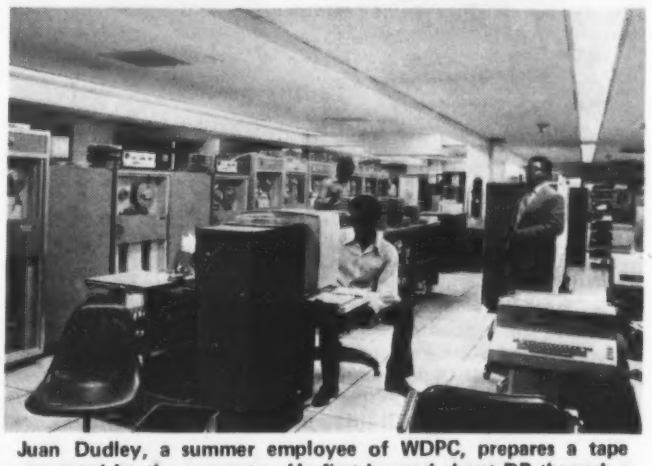
T/S Terminals

The Model 40 has 40 interactive time-share terminals linked to it – mostly IBM 1050s and Teletypes. The terminals are located in the metropolitan Washington area, two-thirds of them at Agriculture Department sites and the rest at other federal agencies.

"An average of 35 of the 40 users use the 360/40 every day, five days a week," said Long.

The 360/65 has 16 remote job entry terminals including IBM 2780s, Data 100s, an IBM 1130 computer and two Univac 9300s currently being tested. "We allow our customers to choose any terminal they want so long as it fits into the system.

"Consumer Marketing Services here at Agriculture selected the 9300s, and Univac is providing the interfacing for the units to the IBM computer system." CMS chose the 9300s because it needed magnetic tape-oriented machines.



Juan Dudley, a summer employee of WDPC, prepares a tape requested by the computer. He first learned about DP through a Saturday course for inner city high school students taught by WDPC volunteers. At the console is WDPC employee Anderson Hunt. On the right is another WDPCer, Otis Williams.

Applications handled by WDPC for the Agriculture Department include crop reporting, the food stamp program, map making, meat inspection and a great deal of data which is fed to the Census Bureau.

Work performed for outside agencies includes a Records Information Movement Study (Rims) for the General Services Administration and the fiscal year 1972 budget for the Office of Management and Budget.

In addition to its work for Agriculture and outside agencies, WDPC has become involved in a voluntary effort to teach programming to high school students from Washington's inner city. The classes are conducted Saturday mornings and the students receive high school credit. "It's much like a theory course with some hands-on experience," added Long.

State Cracks Down on Computer Dating

LONG ISLAND, N.Y. – The State Assembly, responding to numerous complaints about computer dating received by the Bureau of Consumer Frauds and Protection, set a price ceiling of $250 and limited the agreement to two years.

Under the measure, the "social referral services" are required to specify a specific number of referrals each month and the buyer is given an option to cancel the contract if he or she doesn't get the specified number for two or more consecutive months.

If the agreement is cancelled, the client will be entitled to a refund of all monies except the cancellation fee of $15.

At the termination of the contract, the service is obligated to return all personal information.

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DP May Minimize Gap Between Haves, Have Nots

By Phyllis Huggins
CW West Coast Bureau

LOS ANGELES – "If we are successful in our mission to bring EDP know-how to developing countries there will be less danger in the gap between the have and have-not countries," says Dr. Gerald Estrin of UCLA.

The ability to really level things out will come in a relatively short time. "We do not want the differences between the haves and have nots to get worse," Estrin says. EDP use, he stresses, can also reduce the danger in the rise of dictatorships. "While EDP does tend to centralize information, at the same time it makes information available to more people."

Estrin is chairman of the Jerusalem Conference on Information Technology, Aug. 16-20.

The results of a two-year study by the United Nations into information processing [CW, April 7] put this technology as the top priority for developing countries, and recommended an international advisory board to aid underdeveloped countries in the use of computers.

"Right now," he said, "they are at the mercy of whoever they meet or whatever manufacturer sells equipment to them. The real power centers in EDP are not about to release information that will help equalize the world situation. This conference will bring people together for face-to-face help.

EDP technology is essential, he says, for developing countries for three main reasons:

- In order to prepare a problem for the computer – a searching analysis at a deeper level than anything else required is necessary. By its very nature this serves to bring order out of chaos.
- In defining problems the country becomes aware of its resources and how to use them.
- By taking workable programs from developed countries, the countries can in one step put the same level of skill and experience to work.

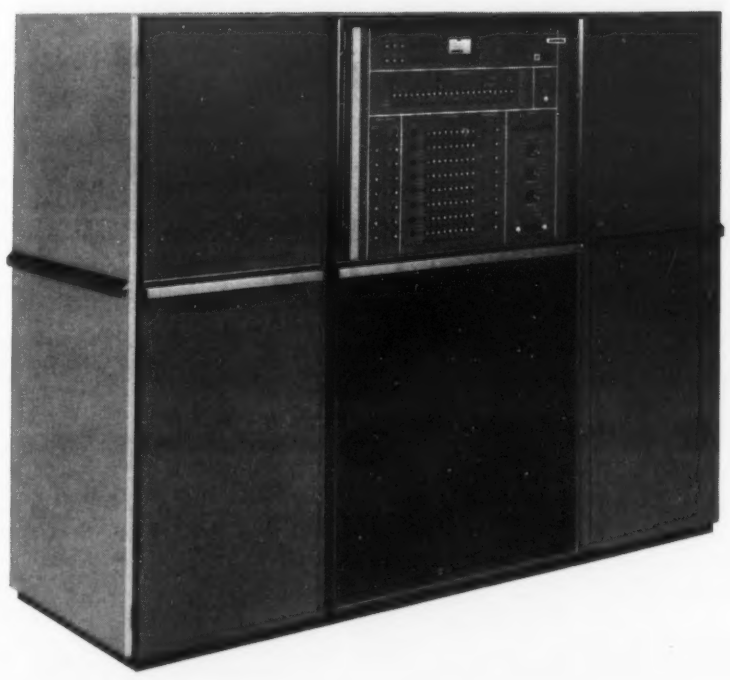
In the UN report Secretary-General U Thant also says computers lack the intelligence to compete with human beings but that there are grounds for fearing they may produce a society controlled by technocrats.

Recent suggestions that the U.S. form a data processing Peace Corps brought a strong response primarily from managers or directors of DP centers. Some had had experience of one nature or the other in a foreign country. All offered their support to the project and most of them offered to serve in a foreign country.

The idea of the DP Peace Corps, according to Estrin, is an excellent one but complicated. The special needs, preparedness and culture gap of the countries involved all have to be considered.

Estrin concurs with Dr. Benjamin Barg, head of the New Technologies Office of the UN, that the UN should serve to help channel talents to the right places under the right conditions. This possibility will be decided at Economic and Social Council's month-long 50th session.

Ampex breaks the throughput barrier



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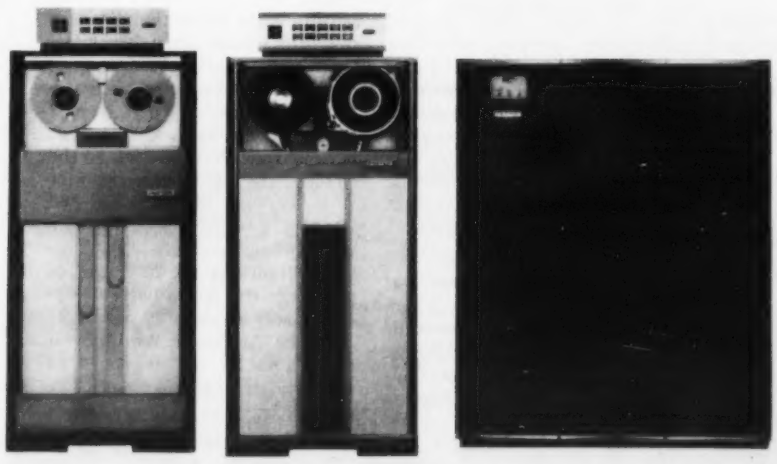
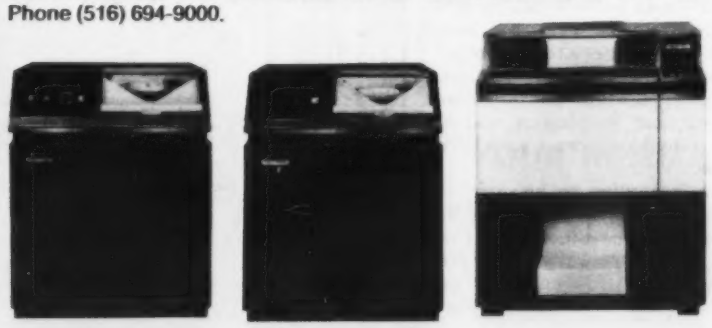


There are thousands of Potter peripherals in use on various computer systems around the world. For complete information on the LP 3403 or Potter Magnetic Tape Units, Controllers, Disk Storage Systems, and Data Terminals call the local Potter office or write to: Potter Instrument Company, Inc., 532 Broad Hollow Road, Melville, N. Y. 11746. Phone (516) 694-9000.



Potter. A lot more than less expensive.

Editorial

Are You Being Watched?

Putting people under surveillance seems to be becoming a national sport.

The latest example brought to our attention involves a bank that has someone copy down the license numbers of cars passing the bank. The license numbers are cross-referenced to the names and addresses of the owners, who then receive a letter from the bank that states, "I've noticed you driving by our office on Blank Avenue regularly, and it occurred to me that it might be to your advantage to turn some of your trips past the bank into trips to the bank."

Whether this system is an invasion of privacy we will leave to others to decide. What concerns us is that the bank is making possibly untrue statements over the signature of a branch manager.

Even assuming that the cross-reference from number to owner has been correctly made, the only fact known is that the person's car was observed passing the bank. It is not known that the owner was in it.

Yet the bank is sending out letters personally addressed to the owners which state, "I've noticed you driving by," even though the owner may never have been in that area.

It makes you wonder just how often "assumptions" become just plain "facts" by the time they are entered in data banks of personal information.

'That Increase Will Do Me a Lot of Good'

Unemployed DP People May Soon Regret 'Good Old Days' of Aerospace Industry

WASHINGTON, D.C. – As a former hand in the aerospace industry, I sympathize with the engineers and computer people who have lost their jobs and who now find it necessary to reorient their thinking and retrain their skills to get work in other fields.

I also sympathize with the aerospace companies who find it necessary to "diversify or perish," as Donn L. Williams, president of North American Rockwell Corp.'s Electronics Group, said at a recent meeting in Los Angeles.

There is no doubt that there will be those individuals and companies who will find the change easier and less shocking than others. There will be some, of course, who will not be able to make the transition.

D.C. Data-Line
By Alan Drattell

For those who have never been in the aerospace industry, it is difficult to understand what much of the fuss is about.

Impossible Missions

Aerospace people have for years been performing jobs that bordered on the impossible – everything from coming up with sophisticated and highly reliable weapons systems to getting man to the moon and back.

The cost, however, of these projects has been astronomical, and the waste abysmal.

Since the major customer was the Federal Government, a general lack of concern regarding expenditures prevailed, despite periodic flurries of what was euphemistically termed "cost reduction" programs.

There was the incident, for example, in which an engineer was carrying a delicate instrument valued at about $35,000. He accidentally dropped it – and was reported to have shrugged his shoulders at the mess at his feet.

Then there was an application our department was to convert from a manual operation to a computer. We discussed the conversion at length with the data center, but the project never progressed beyond a year of talking.

A share of the blame for cost overruns must go to the government, too, however. Too often a company would win an award on a particular system only to have federally inspired changes double and triple the original price.

In the halcyon days of aerospace funding, nobody really seemed to care about costs. It was almost traditional to work overtime – whether it was necessary or not. I recall people in our department doing literally nothing all day long, then becoming involved in a flurry of activiity a half hour before quitting time so that they could put in two hours of overtime to complete the particular project due the next day.

The companies themselves were culpable. There was little or no supervision to prevent this featherbedding, and many firms would bid low to get a project because they knew that the cost overruns would more then make their investment profitable.

In the "good old days," monitoring was perfunctory at best by the government. At its worst, it was ridiculous. There is the classic case of the government reviewer who was so concerned about good grammar in the technical manuals for the Atlas missile system that he lost sight of whether the information was technically accurate or not.

Or the Air Force requirement that pinholes in negatives of technical manual pages had to be opaqued.

The legacy of these atrocious procedures has been that many aerospace companies and aerospace workers have found it quite difficult to convert talents and energies to the commercial market. Things are just done differently there, otherwise the company goes out of business or the worker is fired.

Letters to the Editor

United Farm Workers Needs Keypunching, Programming Help

If you are a keypunch operator or a Cobol programmer, the farm workers need your help.

We are struggling to build a union – and a movement. Because we are poor, we cannot afford to hire highly paid staff people to help relieve us of the staggering paperwork that a growing union processes. Some data processing professionals have already volunteered and have designed a system for us. We are not attempting to implement it.

To do so, we need experienced keypunch operators who would be willing to donate some of their time and skills either in the area where they live or in Delano, and Cobol programmers who would be willing to see this project through to completion for a subsistence wage.

If you can help us, please contact me at P.O. Box 130, Delano, Calif., 93215.

Dave Smith

United Farm Workers
Delano, Calif.

Print Run Degradation One-Third

An article by Frank Piasta on OCR devices [CW, March 31] states that an IBM 1287 run under DOS needs at least 33K of memory to do a job.

I think this is highly application dependent since I was involved in an application which involved only 10K of memory, and, in addition, did not require any additional auxiliary storage such as two additional tape drives.

He does state that, according to his user, the print run that is operating concurrently with OCR would come to a virtual standstill. This was not our experience. Our experience was that the print run did suffer some degradation but never over 33%. Most of this was due to contention for a selector channel.

Perhaps this particular user should examine his own uses of his computer as well as what he has running with what in a multiprogramming environment.

Mike Gaal
Manager of Data Operations

Peoples Trust Bank
Fort Wayne, Ind.

The article dealt with the experiences of one user, a large bank, which told CW that a full partition of 32K bytes of memory had to be reserved for the peripheral drivers and applications programs required by its OCR procedures.

It is possible that less demanding procedures could result in a decrease in core requirements to the 10K level and that the degradation in print could be kept to 33%. But one-third degradation is a high price to pay in loss of efficiency. Ed.

A Firm Just Flexing Its Muscles?

Unfortunately, it is an accepted fact that most marketing people tend to make exaggerated claims about their product, especially in a new technology market.

Never have I seen this better illustrated than in the article, "Large Storage Unit Field Shows Activity" [CW, April 7], where an Ampex spokesman noted that there was not much competition to its Videofile.

Albert J. Jones
Regional Sales Manager

Mosler Information Systems
Hamilton, Ohio

Shame, IBM, How Could You Use Your Poor Users So?

Next month a lot of IBM 360/25, 30 and 40 users – and not a few 50 ones as well – will have a problem to face. On July 1 Sort/Merge 450, the old warhorse, stops receiving IBM maintenance, in accordance with the six-month notice sent out last December.

This means that either the users have now got to start using supported software for their sorts – which is something I would not recommend – or alternatively that they have to go elsewhere.

The Taylor Report
By
Alan Taylor, CDP

And therein lies the rub. Indeed some unkind souls might even suggest that IBM, in removing support for 450 at this time, is principally interested in seeing that its users do go elsewhere – and move up from "free" software to paying for their software by buying the new IBM sort SM1 at nearly $1,000 a year ($960 to be precise). If you look at the timing of the announcements, it could look like that. SM1 was announced just a year ago, in April, and delivered in June. When this had safely taken place, so the idea runs, then IBM got on with the job of letting its "free" sort obsolesce so as to get users into the new market.

'Propose SM1 . . .'

To some extent there appears to be some basis for suspecting this, if only because of the instructions that IBM salesmen receive about when to sell the paid-for SM1.

"Propose SM1 to your DOS users and to all new prospects," J.F. Manning, vice-president, marketing, wrote to them. No exceptions were suggested – no mention was made of the idea that some users might just as well stay with the free software that they were promised when they signed up. Just the simple instruction, "Propose SM1 . . ."

But there are other sides to the coin. Performance, for instance, is of paramount importance in sorting. Sort time is still the biggest single user of computer time – and time saved in sort routines can be very important.

Moreover, performance is exactly what IBM stresses in its program announcements for SM1. "A New DOS Tape and Disk Sort/Merge Program Betters Performance" trumpets the heading. Underneath details are given:

'Performance Improvements'

. . . The performance improvements demonstrated when compared with SM-483 have been:

- 18%-42% for 10K DASD sorts.
- 11%-16% for 22K DASD sorts.
- 6%-9% for 52K DASD sorts.
- 4%-13% for 80K DASD sorts.
- 4%-11% for 116K DASD sorts.
- 13% for 10K sorts.

But No 450 - SM1 Comparisons

All of which is very interesting, and can be very impressive, but which simply does not directly interest the user of the old Sort 450 warhorse (whose problem is the one we are considering), nor does it justify that unqualified claim that SM1 "Betters Performance."

It may better 483 performance . . . but better 450 performance? That's a question that Manning's letter didn't bring up.

Yet that is the question that users of Sort/Merge 450 must now contemplate. And their answer one way or the other could mean an annual income from SM1 of $20 million to IBM, which is quite enough cash so that users can reasonably expect to be provided with useful and accurate information.

One way to try to get the real comparisons between the 450 Sort and the SM1 is to go back and to look at the claims put forward by IBM for the 483 sort when it was announced. Then, as IBM has provided comparisons with the 483 to SM1 and 450 to 483, perhaps we will be able to make some sense out of the data.

These earlier figures were put out by Manning's predecessor in marketing, C.B. Rogers Jr. Interestingly enough, Rogers' letter to his salesmen makes no mention of actual performance comparisons, simply referencing the salesman to another section for results of comparison runs between 483 and the earlier 400 and 450 sorts.

Cynics might explain his reticence by pointing out that the section starts out describing not performance improvements, but performance degradations!

Low Performance Shown

To quote the start of the review:

"Performance . . . Comparison runs between the current DOS/360 Disk and Tape Sort/Merge programs and the new Sort/Merge reflect:

"Performance degradation frequently results when operating in small partition sizes, (10K, 22K)."

Performance in 10K . . .

Some actual test cases run by IBM indicated that execution times for this new sort were the product of the current sort execution times and a performance factor which has the following ranges.

	Range	Median
2311	1.0-2.5	1.6
2400	0.9–1.6	1.4

(Example: A 2400 tape sort (360N-SM-400), which takes 60 minutes, may take between 54 and 96 minutes under the new Sort/Merge).

"Performance in 22K shows degradation for most applications using IBM 2311s as work units or using IBM 2400s on one channel as work units. Actual measurements show performance factors ranging from 0.8 to 1.6 with a median at 1.2."

There is more – about performance improvements that were shown when 56K or 120K was used – but that is enough for our purposes.

It adds up to the fact that 450 outperforms 483 substantially, at 10K and 22K partitions, and was not outperformed as substantially even when the partition had been raised to 120K.

Now, going back to that 483 to SM1 comparison, you can see that the partitions where SM1 claimed its great victories of performanace *were exactly those where the old warhorse, Sort 450, had scored equally substantial victories!* In fact, as I see it for users of partitions under 22 – and probably for many up to 56K, the choice that IBM has put before them – and which they have to face in the next few weeks – is:

- Accept a major degradation of performance, by going to 483.
- Accept the risk of using an unsupported program, by staying with 450.
- Pay IBM $1,000 a year to keep being supported at current performance levels, by going to SM1.

And that's not the sort of choice that should be hidden by being split up between a number of documents. Shame on you, IBM, for using such indirect information methods.

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Letters to the Editor

'Button-Pusher' Speaks

Alan Taylor really hits home with his candid observation regarding standards for computer operators [CW, April 28]. Having worked in my early days as a "button pusher," there is no doubt that many operators work under a pressure-cooker environment to get jobs out as fast as they come in. I am sure that many thousand hours of computer time are wasted each year due to sloppy run procedures.

Unfortunately, many output problems have as their original source the programming and systems area. It is there that because of laxity jobs are submitted for production run without building in checks for the operator at certain steps in the job. In our installation, new jobs are accepted by operations if they include concise computer operator instructions which include job flow chart, I/O flow diagram, print samples, carriage control layouts and JCL lists.

Also, we require standards for all programs to contain help for the operators to insure against unnecessary reruns. With this approach we have cut rerun problems caused by operator errors to almost 0%.

Raymond E. Wright Jr.
President
Suburban Computer Services
Palatine, Ill.

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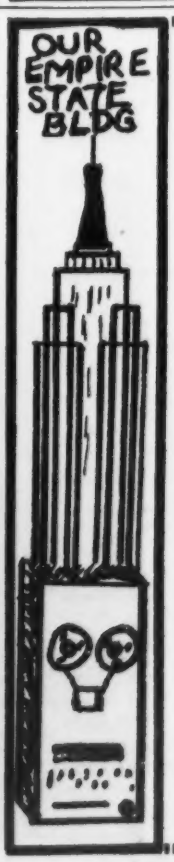

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Fortran Only One Subject

Programming Textbook Called Thorough

By Walter J. Samek
Special to Computerworld

Techniques in Computer Programming, by Philip M. Sherman, Prentice-Hall Inc., Englewood Cliffs, N.J., 1970, 348 pages, $12.95.

This book explains and illustrates the use of Fortran, but there the similarity with other Fortran texts I have seen ends. The best word to characterize this book is: thoroughness.

Sherman does a fine job of illuminating various other subjects, especially problem analysis, which precedes the actual programming task, and debugging. He provides, moreover, good introductions to some advanced subjects, such as storage allocation and data management.

An imaginary digital computer, the Gamma 70, is introduced and used occasionally to illustrate the use of Assembler Language, or how to simulate the operation of one computer on another. This latter operation, obviously, is an even more advanced one, which the instructor will certainly omit from a beginners' course.

Sherman manages to remain "machine independent" all through the book, never mentioning an actual computer or its manufacturer.

The exposition of Fortran itself is complete and thorough; much space is devoted to those areas which are harder to grasp. I was especially impressed by the separate chapters entitled Input-Output Processes, and Symbol Manipulation. The discussion of string manipulation in the latter chapter, however, goes beyond the limits of Ansi Fortran or any Fortran compiler I am familiar with (although I hear that X3 is working on it).

Snobol is referred to in a footnote, indicating that the student need learn a separate language if he wants to engage in string manipulation. Nonetheless, this chapter will certainly whet the appetite of an alert student.

An excellent book containing much more material than can be taught in one course, this text is suitable for a series of courses.

Walter J. Samek is with Combustion Engineering, Windsor, Conn.

Architecture Includes 'Tricks'

By Oscar Firschein
Special to Computerworld

Computer Architecture, by Caxton C. Foster, Van Nostrand Reinhold, N.Y., 1970, 225 pages, $12.50.

Intended to teach the art of computer design to graduate students and upper level engineering undergraduates, the book starts off in a fairly mundane and straight-forward manner, providing background material in the field.

Interest picks up in the fifth chapter, where a case study in depth of the design of the Blue computer is given. From then on, the material is extremely interesting, clearly presented, and includes a large number of "tricks" of the trade.

The latter portion of the book deals with addressing techniques, input/output, and methods of speeding up a computer. Unusual designs involving parallelism and distributed logic, and tesselated computers are given in the last two chapters.

Interesting questions which help clarify the points being made are scattered throughout the text. However, many of the references seem out of date.

The book is also suitable for self-study by programmers having little or no engineering background.

Oscar Firschein is a member of the Information Sciences Laboratory, Lockheed Research, Palo Alto, Calif.

'T/S Design Concepts' Presents Selection Of Techniques Used

By James A. Robb
Special to Computerworld

Timesharing System Design Concepts, by Richard W. Watson, McGraw-Hill Book Co. New York, 1970, 270 pages, $9.95.

The purpose of this book is to present a selection of the common concepts and techniques which have become apparent in the design and implementation of time-sharing systems.

In the introduction to general-purpose time-sharing systems, several types are presented along with design requirements and problems. Systematic guidelines provide assistance to those studying the feasibility of time-sharing.

Hardware concepts such as memory, addressing and relocation techniques, communications, protection and control are also covered.

About half of the book deals with software concepts. Since there is no clear separation of functional responsibility between hardware and software, the author has covered some topics such as system protection, memory allocation and control in both parts.

The last chapter effectively covers the need for measurement, reliability, and recovery procedures to be designed into the system.

Frequent summaries are provided to permit the reader to obtain a general understanding of teleprocessing design problems without needing to digest all of the technical details presented. This makes the book useful to those with a limited knowledge of DP as well as a valuable guide to anyone involved in teleprocessing systems design.

James A. Robb is faculty chairman, Vocational Technical Institute, University of Southern Illinois, Carbondale.

'Assemblers, Loaders' Gives General View

By Ned Chapin
Special to Computerworld

Assemblers and Loaders, by D.W. Barron, American Elsevier Inc., New York, 1969, 61 pages, $4.50.

This very brief book touches upon many topics in compiler writing, but covers no topic in sufficient detail to be useful to compiler writers.

While offering a broad general view and introducing common terminology, it does not, and cannot in its few pages, explain the topics it introduces. It gives the flavor without the substance.

Ned Chapin is an independent consultant in the field of data processing.

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COMPUTERWORLD

book reviews

Papers for 1969 Systems Meeting Make Up 'Ideas for Management'

By James A. Robb
Special to Computerworld

Ideas for Management, edited by Association for Systems Management, ASM, Cleveland, Ohio, 1969, 190 pages, $10.

This is a compilation of the papers and case histories presented at the 1969 International Systems Meeting held in New York City. Some 28 persons contributed ideas for this publication.

The topics have been organized into five major categories which provide easy access to the ideas contributed. The categories are: tools and techniques, systems function, management, hardware and communications.

Most of the contributions deal with existing problems and procedures but several do have some orientation to the future. Each of the contributors is an outstanding person in his field.

Study of IBM Management Information Systems Should Interest 'Old Pros'

By Oscar Firschein
Special to Computerworld

Computerized Management Information System, by Joseph F. Kelly, The Macmillan Co., New York, 1970, 553 pages, $10.95.

The author is systems development and program manager for IBM, and the book is IBM all the way. The computers pictured, the systems described, the approaches used, and even the final uplifting quotation are all IBM.

In fact, the book contains so many IBM trees that it is often difficult to see the forest. In many sections of the book, page after page of CRT messages, flow charts and tabulations intrude on the textual material.

The sophisticated reader will enjoy reading about the nitty gritty of many of IBM's management systems and the techniques for designing them, material that isn't readily available to the non-IBMer.

Among the IBM goodies covered are the Order Entry System, Sales/Marketing Subsystem, Assembly Line Control System, Material Control System, Financial Monitoring System, and Personnel Data System.

The material on the IBM Time Automated Grid (TAG) system for use in system definition, data collection, analysis, and design will be of interest to system designers.

The naive reader who ventures into this thicket of IBM systems may emerge thinking that management systems are synonymous with "IBM."

For such novices, one might have expected that the author would have provided some indication of the components of a computer system and how they interrelate, since a chapter on the history and development of computer components and systems is provided.

The old pro will find much of interest in this book; novices should avoid it unless guidance by an old pro is available.

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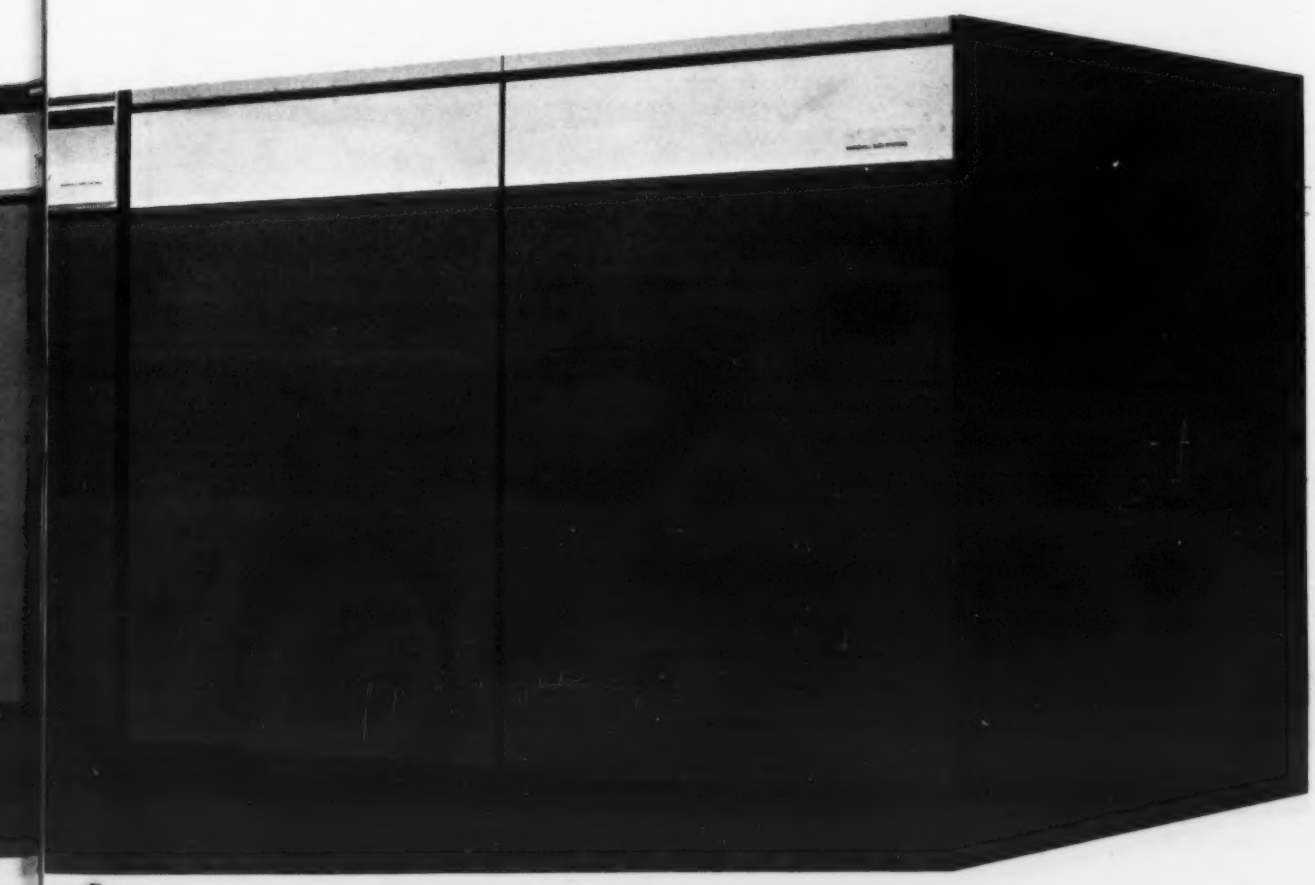

Managers Can Avoid Pitfalls

By James A. Robb
Special to Computerworld

Administering and Controlling the Company Data Processing Function, by Leonard T. Krauss, Prentice-Hall, Englewood Cliffs, N.J., 1969, 282 pages, $19.95.

This book is a must for every data processing manager and executive who has any DP responsibility. The author has carefully selected a considerable volume of management information, refined it with his own experience, and organized it into an effective guide for management action.

The total approach of the text is "planning ahead"; making the correct decision instead of taking corrective action. It identifies some of the most critical areas for management success and suggests how to avoid pitfalls.

Each chapter deals with a major DP function. The topics range from planning and organizing DP activities through such areas as design, acquisition, staffing training, conversion, and evaluating the DP facilities.

File Structure, Data Organization Covered

By W.S. Hoffman
Special to Computerworld

Data Structure and Management by Ivan Flores, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1970, 390 pages, $13.95.

File structure and information organization techniques, as well as their practical application, are covered in this excellent book. The first seven chapters provide a fundamental introduction to graph theory, simple and linked lists, posting, directories, hash storage techniques and hardware concepts associated with data management.

The remainder of the book consists of practical applications of these techniques using the ubiquitous IBM OS/360 as the model in each case. For example, use of linked lists is illustrated using the Indexed Sequential Access Method and direct files.

The clarity of illustration far exceeds that of IBM manuals. The complete description of disk pack organization is a typical example. This book deserves to be on the book shelf of anyone developing direct access oriented information systems.

W.S. Hoffman is with the Information Systems Division of E.I. DuPont de Nemours, Inc.

Computer Science Study

Junior College, University OK Degree Plan

TULSA, Okla. – A cooperative computer science program between Tulsa Junior College and Oral Roberts University will permit TJC two-year graduates to enter ORU as juniors and earn a bachelor of science degree in either mathematics or business administration.

Officials of the two schools expect the program to be in full swing by September 1972 but a few students may begin their work by this September.

This is the first such program between a public and private school of this type, according to Oral Roberts, ORU president. Roberts said the program will "strengthen Tulsa's position" as one of the largest computer operation centers in the nation.

Elkins Institute and Southern Methodist University have recently begun a cooperative program to allow transfer of credit from the vocational school [CW, April 28], while Control Data Institute students will be able to receive credit from the University of Minnesota toward an Associate in Arts or Bachelor's degree [CW, May 5].

Since ORU does not have the necessary DP equipment, ORU will now utilize TJC's computer science institute. TJC has 628 students in its computer science program and it is expected that only about a dozen students will enter the program the first year.

Dr. Alfred M. Philips, TJC president, said the joint effort will allow TJC graduates to enter ORU on a part-time and evening basis to work on the final two years of their degree.

A Reckoning in June

BEVERLY, Mass. – Computers have come to the high school here and are being leased until the end of the school term in June, at which time it is hoped the school committee and board of aldermen can get together on the purchase of computers for municipal as well as school use.

There had been a question of whether the computers should be installed in the junior high schools or at the high school.

COMPUTERWORLD

education

Syracuse Program Trains Undergraduate Designers

SYRACUSE, N.Y.,– A program to train undergraduate engineering students in the design of computers and their peripheral devices has been established by the Syracuse University electrical engineering department and will begin accepting students next fall.

Dr. Edward Stabler, one of the professors who will teach the program, explained it will emphasize computer hardware but will offer enough instruction in programming to familiarize students with this aspect of the field as well.

The four-year program is under the chairmanship of Dr. Wilbur LePage and will lead to a bachelor of science degree.

Honeywell to Sponsor DP Camp

NEW YORK – Honeywell will sponsor a scholastic competition to select 20 high school juniors to attend an expense-paid, coeducational summer camp in Wisconsin on computer science.

Winners of the scholarships will be selected from the approximately 200 secondary schools in 11 states participating in Honeywell's Edinet network. Edinet offers computer-assisted instruction to more than 300 educational institutions and 300,000 students and teachers in California, Georgia, Iowa, Massachusetts, Michigan, Minnesota, Missouri, New York, Ohio, Virginia and Wisconsin.

Each Edinet secondary school is permitted to enter one student in the competition, and winners will be selected on the basis of designing, implementing and documenting the most original and outstanding computer programs. Programs may be of any type – gaming, business data processing, scientific, mathematical, administrative, etc.

In order to provide maximum opportunties for individualized instruction, the camp's class size is limited to 10 persons. The first session will be held from July 12-16 and the second from Aug. 2-6.

During the 5-day camp period, students will participate in a 45-hour course entitled "Computer Science Two" and will have additional opportunities to pursue individual computer interests.

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Canadian June DP Conference Cancelled

TORONTO – Poor economic conditions have caused cancellation of the Canadian Data Processing Conference next month, but the Computer Show scheduled by a different society appears healthy.

The DP conference scheduled for June 9-11 will resume as a portion of the Canadian Business Equipment Manufacturers' Association "highly successful" business show in November, CBEMA has reported.

The DP conference originated as part of CBEMA's Canadian National Business Show, but separation was attempted for the first time after 13 years of combined efforts, the group stated.

This turn of events is not to be confused with the Canadian Computer Show, Exhibition Park here Sept. 15-17.

The Canadian Information Processing Society reports its Computer Show is "alive and well and getting bigger every day." Cips predicted attendance would "greatly exceed" the 15,070 registered visitors at the 1970 Montreal event.

The cancelled conference of CBEMA will be absorbed by the business fair Nov. 15-18, in Montreal. Patrick J. Suddick, president-elect of the association, said the "outstanding seminars on computer profitability for management personnel," which had been planned for the June show, will be moved to the "combined show."

He said that, while initial response to the separated show was good, business conditions this year are "not conducive to the introduction of such a show nor could we mount the calibre of show which we have sponsored over the past 13 years."

Suddick said his association might sponsor a separated show in the future, if the "needs of the industry" dictated.

Conn. S/3 Users Form Group

WESTPORT, Conn. – Increasing computer profitability is one goal of a new group of IBM System/3 users, formed here recently for Connecticut owners/lessees/expectees.

Organized by George S. Ahmuty – who among other activities deals in used IBM equipment – the group plans to trade programs, provide systems services, evaluate "less expensive non-IBM peripherals," and facilitate conversions and changes.

Negotiate With IBM

Ahmuty also stated the group would provide test time and 80- to 96-column conversions to members, sell software to nonmembers and negotiate with IBM for "consistency of services."

The group has a tentative name of Users/Three, and Ahmuty reported a "second organizational meeting will be held shortly."

A Mini-Joint by Another Name...

PALO ALTO, Calif. – The successful mini-joint computer conferences (average number of exhibitors-12) have proven so successful that Afips seems to have forced them to change their name. The intimate conferences, sponsored by a few independent companies, have caught on as being an effective means for small companies to show their wares.

So effective have they been that Afips, sponsor of the joint computer conferences, received about 500 letters from companies wanting more information on the "mini-joints."

Afips, "in a friendly fashion," according to President Richard Tanaka, suggested to the mini organizers that they were really riding on the joint conferences' coat-tails and they should change their name. Industry sources said that it went farther than friendly persuasion, with Afips threatening to sue if they didn't change their name.

As a result, the next ex-mini-joint (held in Palo Alto on April 22) was called, gulp, the Northern California Computer Invitational Conference.

COMPUTERWORLD

societies/user groups

Decus Observes 10th Anniversary

MAYNARD, Mass. – The tenth anniversary of the Digital Equipment Computer Users Society (Decus) was observed at a meeting of the society's board of directors by joint presentations between the presidents of Decus and Digital Equipment Corp.

Kenneth H. Olsen, president of the manufacturing company, presented the user group with a plaque commemorating the society's tenth anniversary, noting its growth over that time to the largest and "most active" computer users' society in the world.

Olsen commented on the impressive growth and activities of the society as he made his presentation recently.

Richard J. McQuillan of Composition Technology, Inc., the president of Decus, presented Olsen with a collection of Decus publications dating from its beginnings to the present, reflecting the growth of the society. Since DEC supports the society, both officials expressed pride in the progress Decus has made since its beginning.

Decus claims to be the world's most active computer users' society, with a membership nearly "double that of the next 12 computer user societies combined."

Formed to permit interchange of ideas between users of Digital Equipment Corp. computers, the society has evolved into a forum for advances in both computer hardware and software development.

The society's 9,000 members in over 40 countries in the free world represent almost all areas of science, medicine, engineering, education and commerce.

Telecom '71 Expects 1,000

GENEVA – More than 250 companies and 1,000 delegates are expected to take part in Telecom '71, an international exhibition to be held in Geneva June 17-27.

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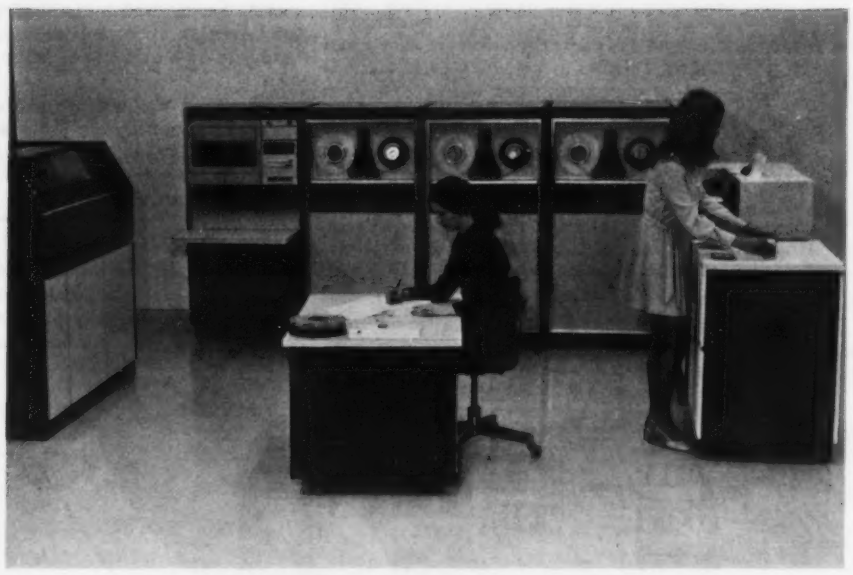

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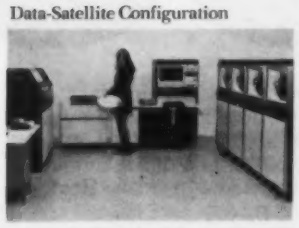

Data-Editor Configuration

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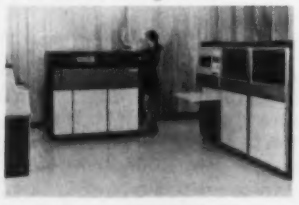

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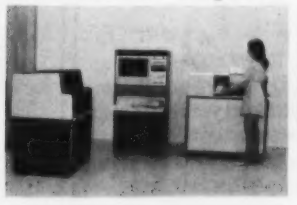

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Random Notes

Standard Set for Coding Of Serial Publications

NEW YORK – Libraries, other organizations concerned with information handling, and subscription agencies can use American National Standard, Identification Number for Serial publications, Z39.9-1971, to code periodicals, newspapers, reports, yearbooks, and similar publications for cross-referencing and data processing.

Under the standard, an eight-digit code number is to be assigned permanently to each serial publication and the coding will be done by the Library of Congress. Copies of the standard are available for $2.25 from Ansi at 1430 Broadway, 10018.

COM-700 Software Generates Titles, Indexes for Microfiche

NEWTON, Mass. – "Eye-readable" titles and data indexes can be formatted on microfiche from text in user-specified data fields, or from fixed constants, with new software capabilities on the Beta Instrument Corp. COM-700 computer output microfilm system.

The new feature is said to be the first self-contained titling and indexing package available for COM users. The Beta COM-700 output is on 16, 35, 70 or 105 mm film, the company said from 20 Ossipee Road, 02164.

Professionals Get Statements, Business Reports From 'Cemis'

PHOENIX – The Client-Employee Management Information System (Cemis) from Western Data Sciences Inc. provides lawyers, accountants, engineers and other professionals with customer statements and reports of business activity and profitability. The package has a lease price of $3,500 from 5055 N. 12th St., 85014.

'Autotab' Users on GE Network Provided Better File Support

PHOENIX – The Autotab financial planning system, developed by Capex Corp. and available on the GE time-sharing service, has been enhanced to allow users to selectively extract information from almost any data files.

Previously, users were limited to files specially generated by Autotab, Capex said, adding that now users could work with data that is produced by another program. Autotab output can likewise be used as input to other programs, the company said from 2613 N. 3rd St., 85004.

Used Software Worth Money

BOSTON – Users of other software may be granted as much as $5,000 "trade-up" credit toward the lease or purchase of the Cullinane Corp. Culprit or EDP Auditor packages.

The amount of the credit depends on the original price of the package being replaced and the number of years it has been in use, Cullinane said from One Boston Place, 02108.

AF Sheds 'Lite' on Legal Files

DENVER, Colo. – The search and retrieval facilities of the Legal Information Thru Electronics (Lite) system provide access to a number of data bases including the United States Code, to all Federal, state and local government agencies.

Run by the Air Force at 3800 York St., 80205, Lite charges $50 per search per data base. The service is unavailable to non-government users.

For Program Development

360 Simulates PDP-11, Varian Minis

By Don Leavitt
CW Staff Writer

SAN FRANCISCO – Users of DEC PDP-11 or Varian 620/i minicomputers can develop their programs on an IBM 360 with the Mini-Sim package from Trippe Systems Inc. The package uses a portion of the 360 to simulate the mini so that program assembly and testing can be done more quickly and more cheaply than on the mini, Trippe said.

Assembly and debugging of the mini programs is faster on the 360 principally because of the faster I/O peripherals on the IBM system. A secondary advantage is that production use of the mini no longer need be disturbed for development, Trippe said.

Mini-Sim is not a substitute for the assembler that is used on the mini itself, Trippe said. The new package provides another environment in which the mini assembler can be used.

Because it is a simulator and not a cross-assembler, Mini-Sim does not produce programs that must, thereafter, be reassembled on the 360. This is often the case, Trippe said, when a cross-assembler takes advantage of a 360 feature not available on the mini.

Mini-Sim is not the only package which allows PDP-11 programs to run on a larger "host" machine. Software which uses the PDP-10 as the host is available from Decus, the DEC users' group.

Programs assembled in the Mini-Sim environment can be debugged on either the 360 or the mini since part of the package provides for simulation of the peripherals as well as the central processing unit of the mini.

After debugging, the program will be fully operational and ready to load on the mini. Later reassemblies to handle program modifications can be run on either the 360 or the mini, Trippe said.

Mini-Sim is priced at $3,750, including source program, user documentation and sample programs. Delivery is 60 days from 120 Montgomery St., 92104.

Letters Stored on 360 Disk File, Personalized, Printed by 'LWS/2'

WOODLAND HILLS, Calif. – A letter writing system that can produce multiple 'personalized' copies of up to 255 different letters in the same run, LWS/2 is available from CBIS.

LWS/2 can print different upper- and lower-case letters side by side and each letter may contain five different inserts in addition to name and address, the company said.

The system provides file maintenance programs for the updating of letters stored on a direct access file. Basic text can be added, changed or deleted so that the letters present fresh ideas even if sent to the same people two or three times in a row, CBIS said.

LWS/2 prints one- or two-up letters, one- or two-up envelopes and one- to four-up labels. Letter text width may be varied from the console, at production time, and may range from 10 to 75 characters. Envelope and label positioning and width are console-controlled variables, when desired.

The CBIS system adjusts entire paragraphs for the varying sizes of inserts, and hyphenates words when necessary. With LWS/2, each printer can produce more than 2,200 letter/hr, according to company estimates. The package allows the user to request test letters to check the alignment of his stationery.

Written in BAL, LWS/2 operates on the Model 25 and larger 360s. DOS and OS versions are available. The DOS version requires a 24K partition in addition to the disk for the letter file. LWS/2 may be purchased for $3,500 for the first site, and $600 for each additional location. CBIS is at Suite 307, 6355 Topanga Blvd., 91364.

Banks, Distributors Get NCR Aid

DAYTON, Ohio – National Cash Register Co. has released separate software packages to provide demand deposit accounting for medium-size commercial banks, and order and inventory processing for hard- and soft-goods distributors, using Century series CPUs.

The DDA program is said to provide efficient handling, including account reconciliation processing, for up to 80,000 checking accounts, on either the Century 100 or 200. A list-post program is provided to combine check transactions for selected high-volume accounts along with stop payment and ARP.

The distributor's Order Billing Technique II package is a post-billing, batch-oriented system for multi-warehouse operations.

The Order Billing package can be implemented in 16K on the NCR Century 50. The DDA package can also be installed in 16K of memory but requires the Micr reader/sorter that is not available on the Century 50.

Faster, More Compact FMS Added to 'Action/APL' Net

RICHMOND, Va. – The Computer Company (TCC) has developed an enhanced version of the FMS file system which provides bulk storage for APL users external to the workspace. The new version requires approximately 800 fewer bytes in the workspace and operates up to 50% faster than the original FMS, the company said.

The new file system is available through the Action/APL time-sharing service, an affiliation of TCC; APL Services Inc., Trenton, N.J.; Computer Innovations, Chicago; and Proprietary Computer Systems, Van Nuys, Calif.

Package Analyzes Execution To Improve Fortran Program

SANTA CLARA, Calif. – Fortran programmers operating under OS/360 should be able to optimize existing programs and develop more effective ones in the future with the Fortran Maximizer (Formax) package from Computer Synetics Inc. (CSI).

Five optional reports are produced to analyze the code activity of the subject program in terms of frequency, time, program activity, subroutine usage and statement type summaries. Optimization is generally accomplished by using the reports to identify those areas of Fortran code that account for the majority of the running time.

Formax inserts code into the user's source program prior to compilation in order to perform the measurement functions. Code selected for analysis, including I/O statements, is timed by accessing the OS supervisor, to provide the user with actual rather than estimated results, CSI said.

Once the most time-consuming code has been identified, it can often be rewritten with savings of up to 50% in execution time, a spokesman noted.

All execution activity data collected by Formax is reported directly in terms of the user's source language statements, so there is no need to cross-match machine addresses through an object program listing or linkage editor map.

Formax may require as much as 100K bytes of core during the editor run when the specialized code is added to the source program before compilation.

Once optimized using Formax, the user's programs would be recompiled without the Formax coding before being used for production purposes. It is available for $7,500, from 283 Brokaw Road, 95050.

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'Roll' Relocates Programs

NEWPORT BEACH, Calif. – A new version of the object language loader for Computer Automation Inc.'s (CAI) Model 116 and 216 minicomputers is said to require only 315 decimal words of memory, and to allow the user to locate his programs anywhere in core.

The Relocatable Object Language Loader (Roll) effectively extends available memory by 150 to 700 words compared to other loaders, the company said. Roll also permits the linking of several individual routines into one single program in memory, even through the routines may have been assembled at different times.

Roll effectively completes the assembly process on the 116 or 216. It uses as input the object language tape generated by the Able assembler from the user's source statements. Roll assigns specific addresses to instructions and to data fields, once the program's position in memory has been determined.

Series of object language tapes, each representing a separate program, can be loaded consecutively into core by Roll to produce a large single program. This linking of programs is the method used to incorporate the utility subroutines provided by the company, into user programs, CAI said.

Roll is available without cost to current CAI 116 and 216 users from 895 West 16th St., 92660.

Data Generator Uses Input File

By Don Leavitt
CW Staff Writer

BURLINGTON, Mass. – The Pro/Test data generator package, with which the user can create a file and/or report from control cards, has been expanded to allow the reading and selecting of data from an input file as well.

The enhanced package, called the Pro/Test File Processor, is available from Synergetics Corp. and operates on System/360. It is able to handle I/O files on cards, tape or disk, with the single exception of randomly organized data sets on disk.

With input capabilities, the package can be used for file conversion, correction or reorganization tasks. Generalized input editing can be performed, and the output can be a stripped version of the input, for use in testing programs with real but limited volume data, the firm said.

The generalized report writing capabilities of the older test data generator are available on the File Processor package as is the basic function of building test data files from user-defined parameters.

With the new package, the output file or report may include a combination of generated and selected records, the company said, to meet the user's exact needs.

Implemented on a 65K IBM 360 under either DOS or OS, the complete Pro/Test File Processor is priced at $7,000 on a five-year lease arrangement.

The generator and the file selection features are available separately for $5,500 each. The selection capability is available to current users of the test data generator for $2,100. Synergetics Corp. is at One Garfield Circle, 01803.

'Cosybug' Aids Interactive Tests of Cobol Programs

NEW YORK – A programmer can locate the point in a Cobol source program at which a program interrupt has occurred, and examine or alter data, on an interactive basis, with the Cosybug package from PDA Systems Inc.

The symbolic debugging package also permits the user to suspend or resume execution at any point in the program.

Cosybug becomes part of the operating system environment, according to PDA Systems. Users can specify "breakpoints" at which the program will stop for programmer review, regardless of other conditions.

Otherwise, the program can be allowed to run until a program interrupt occurs. At that point, the user is transferred to Cosybug control and may use any of the English-like statements of the command language in order to solve the problem, the firm said.

With the PDA debugging program, users may examine or alter data fields, find the origin of PERFORM instructions and determine the status of each file being processed.

The debugging does not require any special source coding in the Cobol program.

The package has been successfully installed on an IBM 360/67 and can be used on any of the 360 time-sharing systems, PDA said. Presently under development, a batch-mode version of Cosybug will be ready in two or three months, according to a spokesman.

The package costs $15,000 from 12 East 86th St., 10028.

Batch Installations Use CCI Business System

ENGLEWOOD, Colo. – Computer Corp. International (CCI) has developed a batch-oriented Management Information and Accounting System (Mias).

Key to Mias is said to be its ability to produce special reports on demand by interrupting but not disrupting normal processing. The package generally handles accounts receivables, payables, payroll and other business applications. Written in Fortran IV, Mias costs from $9,000 to $30,000 depending on options, from 3375 S. Bannock, 80110.

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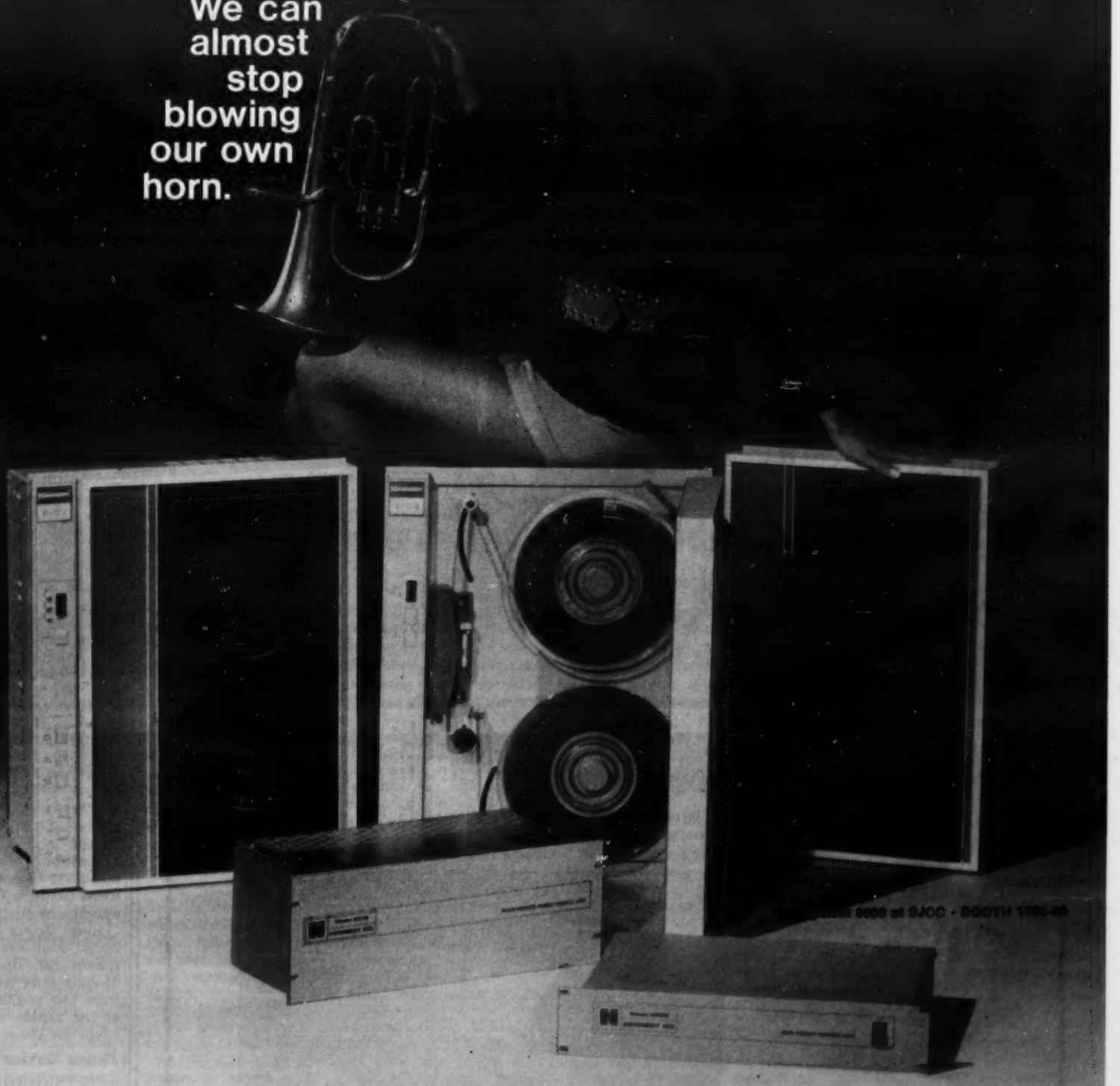

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AT&T Cuts Private Data Rates

By Don Leavitt
CW Staff Writer

WASHINGTON, D.C. – AT&T has apparently decided to expand its low-speed private line services for data users.

A new tariff filed with the Federal Communications Commission would provide Data Line Concentrator equipment at rates one user estimated to be 30% lower than those charged for the same devices under the previously available Datrex service.

The interstate rates are scheduled to become effective in May as part of the FCC Interstate Tariff No. 260. The revision covers the 10A Data Line Concentrator which allows up to 128 teletypewriters to have low-cost access to a time-sharing computer.

Incompatible Data Set

The data station lines are grouped into 8, 16 or 32 trunks. The lines and trunks utilize half-duplex facilities capable of transmitting signals at rates up to 150 bit/sec, according to AT&T. Each terminal handled by the 10A concentrator requires a Bell 109 data set, which is incompatible with the standard 103 data set.

As part of the recent AT&T TWX sale to Western Union, Bell has agreed not to provide low-speed data terminals to users on dial-up lines for five years.

PSC Considers Tariff

Rochester Test Can Open Data Lines

By Ronald A. Frank
CW Technical News Editor

ROCHESTER, N.Y. – A proposed testing method that would automatically open a subscriber's data line has been described by Rochester Telephone Corp.

The testing method is part of the simplified interconnection tariff proposed by Rochester Telephone and suspended by the New York Public Service Commission pending the completion of current hearings.

As part of the interconnection tariff, Rochester telephone would provide users of noncarrier data sets with a special Network Protective Device (NPD), which is described as similar but less complicated than the DAA devices now required on Bell System lines.

Rochester Telephone, an independent phone company, has proposed to supply the NPD device at no cost as part of a new class of service for customer

Communications

owned and maintained (Coam) data equipment.

The Coam user would be subject to a certification procedure to determine whether his noncarrier data set complies with Rochester Telephone interconnection criteria. This certification would be accomplished through twice-a-year inspections by Rochester Telephone.

One of the main features of the NPD device is a relay that enables the phone company to test a Coam user's line by simply pushing a button on a test board at the central office. Although the user would get no indication of such a test, it would be done only in response to service complaints, according to Rochester Telephone officials.

In addition to saving time since a maintenance visit may be avoided, the line testing feature can save the Coam user added costs. In instances where a line is tested from the central office, Rochester Telephone proposes a fee of $3.75. If the user then insists on a field visit, a fee of $10 will be charged.

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*For those who missed the October 14, November 25, December 2 and January 27th issues of Computerworld, AMIGOS ("friend" in Spanish) is the data processing industry's most powerful file access method which will completely replace ISAM on the S/360.

Data Briefs

MIS Given OK for Sharing Without Tariff Approval

WASHINGTON, D.C. – The FCC has notified Management Information System Inc. (MIS) that it would have no objection to the company proceeding with the untariffed shared use of facilities leased from communications common carriers.

A proposed MIS tariff was strongly opposed by the established common carriers, and the commission suggested that it be withdrawn.

ADS Provides Channelizing Option on Equalized Modem

CANOGA PARK, Calif. – A channelizing option now available on the ADS-448 Automatically Equalized Modem from American Data Systems provides a capability previously unavailable without a multiplexer.

With the option, the input data channel to the modem can be divided into as many as four separate channels with different data rates (in multiples of 1,200 bit/sec) as long as the total does not exceed 4,800. The basic ADS-448 costs $6,000. The channelization options range from $150 to $750, from 8851 Mason Ave., 91306.

Varian 620 System Can Function As Concentrator, Preprocessor

IRVINE, Calif. – The time-multiplexed Varian 620/DC Data Communications System can serve as a data concentrator, linking a number of low-speed lines to one or more high-speed facilities. It may also be used as a communications preprocessor.

Using Varian 620-68 Communications Controllers and a 620/f mini, the system can handle up to 128 individual lines with transmission rates from 110 to 4,800 bit/sec. Basic price of the system is $9,000, from 2722 Michelson Drive, 92664.

Phone Service Studied by WTSC

PITTSBURGH, Pa. – Evaluation, selection, design and analysis of equipment and facilities are provided users under the Telecommunications Services of Westinghouse Tele-Computer Systems Corp. (WTSC).

As part of the service, WTSC consultants study basic telephone and "written-record" systems such as TWX or Telex. They also analyze long-distance costs and usage, special voice and data transmission applications. Cost of the service depends on the user's common carrier billings, WTSC said from 2040 Ardmore Blvd., 15221.

Bits and Pieces

Remote Job Entry Systems Use Low-Cost WTI Reader

ARCADIA, Calif. – Conversational remote job entry terminals can be configured at relatively low cost by attaching a CT Series punched card reader terminal from Western Telematic Inc. between printing terminal and teleprocessor. The model CTA provides 10, 15 and 30 char/sec output from 80-column cards with Ascii compatibility for teleprinter or 30 char/sec terminals. Models CTB and CTC provide 15 or 30 char/sec read rates in Correspondence or Ebcdic code for IBM 2741-type units.

An EIA RS232 dataset connector is used to connect the reader to the keyboard printer.

Purchase price of the 30 char/sec unit is $4,175 with leasing available at $135 to $148/mo. Delivery is eight to 10 weeks from 5507 Peck Road, 91006.

Small Brokerage Houses Can Use SBHS Mini-Based Turnkey System

MANCHESTER, Conn. – A turnkey system said to eliminate front and back office work problems for small brokerage houses has been installed by Search, Inc., a systems designer. It is built around a DEC PDP-8/L computer.

The Search Brokerage House System (SBHS) automates a variety of tasks including reports for the Securities and Exchange Commission and the National Association of Securities Dealers. It can also prepare specialized sales and business reports.

The SBHS includes the PDP-8/L, printer, magnetic tape, and a data source terminal. A typical system can be purchased for $45,000 or leased for about $1,000/mo on a five-year plan from 357 E. Center St., 06040.

Off-Line Data Digitizer System Generates 800 bit/in. Mag Tape

STATE COLLEGE, Pa. – An off-line automatic graphic data digitizing system, the GC-3 from Visicon, Inc., will accept data in the form of maps, charts, graphs or drawings and generate an 800 bit/in. magnetic tape. The tape can be annotated with identification blocks through a keyboard and a CRT is available for monitoring the process or playing back tapes. A package in basic Fortran is available. System prices start at $16,000 and delivery takes 60 days. The company can be reached through P.O. Box 1008, 16801.

User Can Devise Coding Systems For Prenumbered Adhesive Tapes

YORK, Pa. – Prenumbered pressure-sensitive items from York Tape and Label Corp allow users to devise coding and recording systems. Sequence combinations of consecutive and repetitive numbers as well as other copy can be reproduced and perforating and die-cutting combined with printing.

Prenumbered materials in standard formats, the company said, will cost form 25% to 75% more than unprinted equivalents. Delivery is usually in about four weeks. The company can be reached at P.O. Box 1309, 17405.

Terminal Maker Reduces Prices

CANOGA PARK, Calif. – Vector General has reduced prices on its Interactive Graphics Terminals resulting in cuts of about 10% on a typical graphic system.

9200/9300 Leases Reduced

Univac Doubles 9400 Memory Capacity

By Frank Piasta
CW Staff Writer

BLUE BELL, Pa. – Univac has brought its 9400 more into line with newer medium-scale systems by doubling the amount of available memory.

The company also increased long-term lease discounts on its 9200 and 9300 systems and reduced purchase prices on several peripherals.

The 9400 will be available, Univac said, with memory capacities of 192K bytes and 256K bytes. Previously, the maximum 9400 configuration was 128K bytes.

Of interest to current 9400 users is the availability of memory upgrades that can be made in the field, expanding systems to the new, larger memory capacities, for a one-time charge of $300 plus the normal rental or purchase cost.

The availability of the 256K byte capacity could forestall defection of 9400 users to such systems as the NCR Century 300 whose memory begins at 128K bytes. The new increase also brings the 9400 into line with the maximum size of the RCA 2 and RCA 3 models. The increased size of the 9400, together with its cycle time of 600 nsec/2 bytes, makes it competitive with the smaller IBM 370s.

The 64K increment from 128K to 192K, including a third system cabinet, will rent for $2,580/mo and sell for $104,400. The next 64K, to 256K, will rent for $1,500/mo and sell for $59,100 and includes a fourth cabinet. The complete 192K 9400 processor is priced at $7,530/mo or $287,320, while the 256K processor leases for $9,030/mo and sells for $346,420.

The changes in pricing of the 9200 and 9300 series affect three- and five-year contracts. The current user with a three-year agreement, however, will not benefit from the new arrangements, and the five-year lessor must have had his lease in effect for at least two years in order to convert to the new terms, Univac said.

On a level payment agreement, the signer of a three-year lease will get a discount of 15% for eacy year, while the five-year lessor will get a discount of 25% a year. Previous discounts on a five-year lease was 15%.

Three-year leases on the 9200 and 9300 were not previously available. Terms under the reducing payment agreement for five-year leases have also been reduced.

Price cuts of 50% on purchase as well as three-year and five-year leases for the 8410 disk cartridge storage system were announced, resulting in a purchase cost of $6,738.

Cuts of 35% on the purchase prices of the following units were also announced: 1001 card reader/sorter, Fastrand II magnetic drum, Uniservo VIII magnetic tape drive and the DCT 2000 data communications terminal. The price of original models of the VP and VIP keypunches were decreased by 30%.

CRT Series Includes Hard Copy, IBM, Teletype Replacements

MOUNTAIN VIEW, Calif. – A series of eight modular alphanumeric CRT terminals from Photophysics that can replace IBM 2260 and 2265, as well as Teletype 33 and 35 terminals, includes keyboard displays with hard copy output.

The new models are composed of four pairs of units each with similar characteristics, one of which has provision for hard copy.

The hard-copy device uses the company's Quantafax method to produce an image on 5 in. by 4-1/2 in. paper similar to bond, the company said. Black characters are produced with an electrophoretic toner, and resolution in excess of 10-line pairs per millimeter is claimed.

The initial copy is delivered, the company said, within five seconds, with additional copies produced at two second intervals. Cost per copy is less than one cent, the company said.

The CRTs use a nine in. standard TV monitor and differ in number of characters displayed and their compatibility. Character generation is in a 5 by 7 dot matrix, with 7-bit Ascii code. The scan method used is a digital raster.

The keyboard is a detachable solid-state unit with 78 keys providing 64 character, 32 control codes, 17 function keys and 12 editing keys.

The models 20, 24, 40 and 44 all include the hard-copy device but are similar in other ways to the 60, 64, 80 and 84.

The 20/60 and 24/64 are compatible with Teletype models ASR 33 and 35. The 20/60 has screen capacities of 25 lines of 25 characters while the capacity of the 24/64 is 12 lines of 80 characters.

The 40/80 and 44/84 are compatible with the IBM 2260 and 2265 terminals. The 40/80 has a screen capacity of 25 lines of 40 characters, while the 44/84 screen can contain 12 lines of 80 characters.

Prices of the terminals on a three-year lease including maintenance range from the 20 and 24 at $305/mo to the 80 and 84 at $192/mo.

Purchase prices for the terminals range from the 20 and 24 at $8,000; to the 80 and 84 at $4,650.

Maintenance is furnished by Honeywell. First shipments are scheduled for July from 1601 Stierlin Road.

Turnkey System Can Provide Simplest Answer to User Needs

By Frank Piasta
CW Staff Writer

With the increasing complexity of programming and lengthening list of available equipment, more and more users are turning to turnkey systems tailored to their particular needs.

Turnkey systems are acquired completely configured with hardware, software and operating instructions to perform a special task.

The list of available turnkey systems is growing daily. It includes systems that perform the accounting functions for a particular industry, or help physicians keep track of patients.

Other systems have been developed to design buildings for architects or aid in selling real estate and life insurance. Building maintenance and security can be controlled by one system and a city's traffic lights by another. Many others are available.

All turnkey system functions could also be done through the use of a general-purpose computer, together with the appropriate peripherals and software. But the key word here is appropriate.

The decision as to whether a particular system of hardware is capable of performing the tasks involved can be a complex matter, demanding careful evaluation. This is especially complicated if the user needs equipment and/or applications not offered by the mainframe manufacturers. Here the job of selection is squarely on the shoulders of the user.

He cannot afford to be under-equipped so the hardware is unable to keep up with system needs, nor over-equipped so that he will not use the capacity available to him. He must consider many factors, including reliability, availability of service, and rate of throughput, in addition to compatibility.

In the area of specialized devices, he may find that interfaces to mate peripherals to his computer are not available.

The system will not work without software, and this requires a staff trained in particularly industry problem-solving methods.

An approach to the solution of these problems commonly used by companies that do not have the necessary in-house capability is to go to outside consultants to aid in selection and evaluation of hardware and design and implementation of software.

The turnkey system manufacturer is, in effect, a consultant that can perform both functions. He has selected the hardware that a typical user in a particular industry can use to best advantage and has configured this into a system, complete with processor, peripherals, controllers and interfaces.

The turnkey supplier has also designed the software system to allow its adaptation to the individual user's needs with a minimum of effort.

The user of a turnkey system will have to give up some measure of the flexibility that he would have with a system that he had developed from components for the guaranteed reliability and performance of the turnkey system.

Some of the prepackaged systems do allow a measure more of individuality to the user by supplying him with assemblers and/or compilers and other software.

The user who has a clearly defined problem area in a common industry would probably find it worthwhile to look into a turnkey system and let someone else worry about how to make it work. But unique applications in uncommon industries still require specially configured systems.

System 515 Terminal Can Emulate Univac, IBM and CDC Units

ORANGE, Calif. – The System 515 remote batch terminal from M&M Computer Industries, Inc. can emulate the IBM 2780, the Univac DCT 1004 or the CDC 200.

Software packages allowing the user to change the characteristics of the terminal in about 30 seconds are supplied.

Besides a processor, the System 515 includes a 300 card/min reader and a 135 line/min printer. Teletype ASR 33 and a 60 card/min punch are available as options.

The remote batch terminal can be purchased for $18,800, or leased for $490/mo, including three emulator packages. It will be available in June from 770 N. Main St.

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PSC

Batch Job Processing on Minicomputers May Prove Cheaper Than Time-Sharing

By Frank Piasta
CW Staff Writer

The user who has been utilizing time-sharing systems to do his scientific processing has an alternative in the form of the larger-scale minicomputers.

These systems, primarily the 16-bit word machines, have sufficient computational power, in the form of floating-point hardware, and large-scale storage with on-line disk systems, to process these jobs on an individual batch basis.

The increasing number of peripherals available for the minicomputers, such as high-speed line printers and card readers, and tape and disk drives, make them attractive alternatives to the installation which has the requirements for a large-scale system, such as the 360/44, but insufficient volume to support it.

Software Support

The increasingly sophisticated level of software support available to the minis has resulted in operating systems that allow the user to define his own batch commands and call on files of precompiled subroutines from a disk-resident library.

The installation with a small number of in-house users can allow each to store his files on the system's disk for ready access. Protection to the data can be afforded by systems of passwords similar to those on time-sharing systems. Busier installations could dump user files to tape for off-line storage.

Even the business-oriented user has not been forgotten, although the main interest of the mini manufacturers continues to be based on the scientific user. RPG that is compatible with the IBM 360 can be obtained from several systems houses for the DEC PDP-15, for example. DEC is reportedly investigating the feasibility of issuing such a package itself.

Analysis

A major shortcoming of the minis, for the most part, is that support for business computation does not extend beyond the software realm. Hardware radix conversion, for example, is not provided, with the user forced to make do with the less efficient software conversions.

Simplicity of both hardware and software packages is said by minicomputer advocates to make them inherently more reliable than the time-sharing systems.

Real-time systems, using interactive methods, however, are still practical for a great number of applications. The large installation, for users with small problems to solve, is perhaps the ideal. Other cases, where the time required to solve problems is so precious that it outweighs the value of computer time, call for real-time systems.

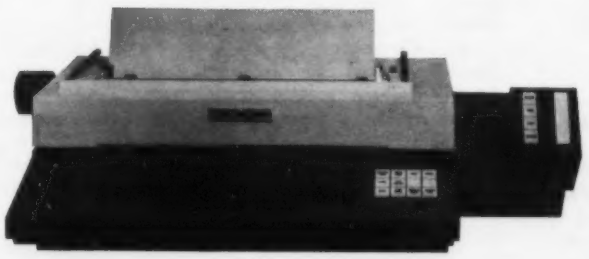
But for most smaller users, the emergence of the "medium-scale" minicomputer, as DEC refers to its PDP-15, will offer the chance to get rid of a large expensive time-sharing system for a small batch processor at one-third the cost.

CRT Gains Hard Copy Unit

WALTHAM, Mass. – Imlac has added the hard-copy HCY-1 peripheral to its PDS-1 alpha/graphics interactive terminal.

Hard copy output is generated photo-optically exactly as it appears on the display screen in approximately 20 seconds, according to the company. Excellent line definition and contrast, the company said, enable the device to achieve accurate reproduction of alphanumerics as well as graphics, regardless of the complexity.

The HCY-1 is available either on a lease basis at $246.75/mo or can be purchased for $5,875. Delivery is 90 days from 296 Newton St., 02154.



Since the NOVAR 5-50 can be *polled and addressed,* many terminals can share a single voice-grade phone line, and can be individually called by the computer using a unique code for each. Will detect transmission errors too, and retransmit until correct.

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Bits & Pieces

Auxiliary Keyboard Aids Numeric Input

BRENTWOOD, N.Y. – An auxiliary keyboard using a 10-key format, from Eastern Dynamics Corp., is designed to facilitate numeric input to teletypewriters or other Ascii-coded terminals. The unit features single key CR, LF and Rubout and 10 optional keys to suit user needs. It can be attached to any Teletype model in two minutes, the company said. The KBG/25 is priced at $295 and is available in 30 days from 1158 Suffolk Ave., 11717.

Low-Cost Modular Racks Hold Multiple DP Binders

HOLYOKE, Mass. – Compatible with other components in the Data Reference Control System from National Blank Book Co., the Control-Rack 909 is a low-cost anodized aluminum rack to hold data processing binders in multiple configurations. Brackets are provided to permit joining the unit to any two other National floor racks. Priced at approximately $30, they are available for immediate delivery from Water St., 01040.

Device Shreds Paper Fast

FREEPORT, N.Y. – The Bantam-10, a portable, typewriter-size paper shredder from the Shredmaster Corp. can destroy up to 300 lbs of paper per hour. It is priced at $280 and is available for immediate delivery from 891 S. Ocean Ave., 11520.

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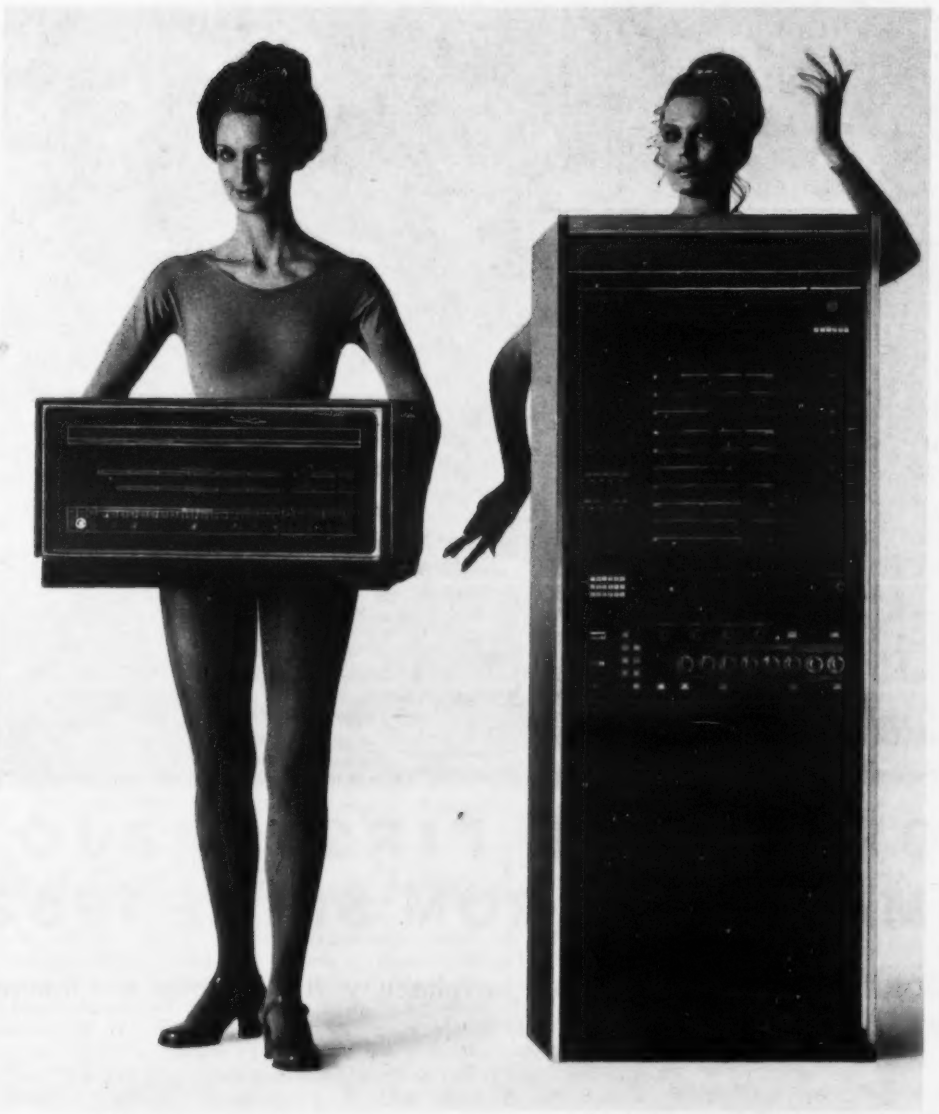
Who says the mini is dead?

A computer fashion forecast from Cybermatics Inc., Fort Lee, New Jersey.



Mini-computer. **Maxi-computer.**

Not in Fort Lee, New Jersey, it isn't!

We're up to our ears in mini-computers. We design software for them.

We're not denying that minis raise problems. They come without much software, so they demand more know-how than most companies can muster. They're a little like mini-skirts: You've got to be sure of yourself to get into them.

A call to Cybermatics (201-461-6171) can give you that sureness.

We don't make minis. Or sell minis. But we're experts at using them in on-line systems. We have to be. Many of our clients (computer-sophisticated companies who were in maxis when we met them) are now getting into minis as well.

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Maximizing this potential takes talent, but in all immodesty we have that talent. In fact, of the eighteen great brains in on-line computers, four already work at Cybermatics.

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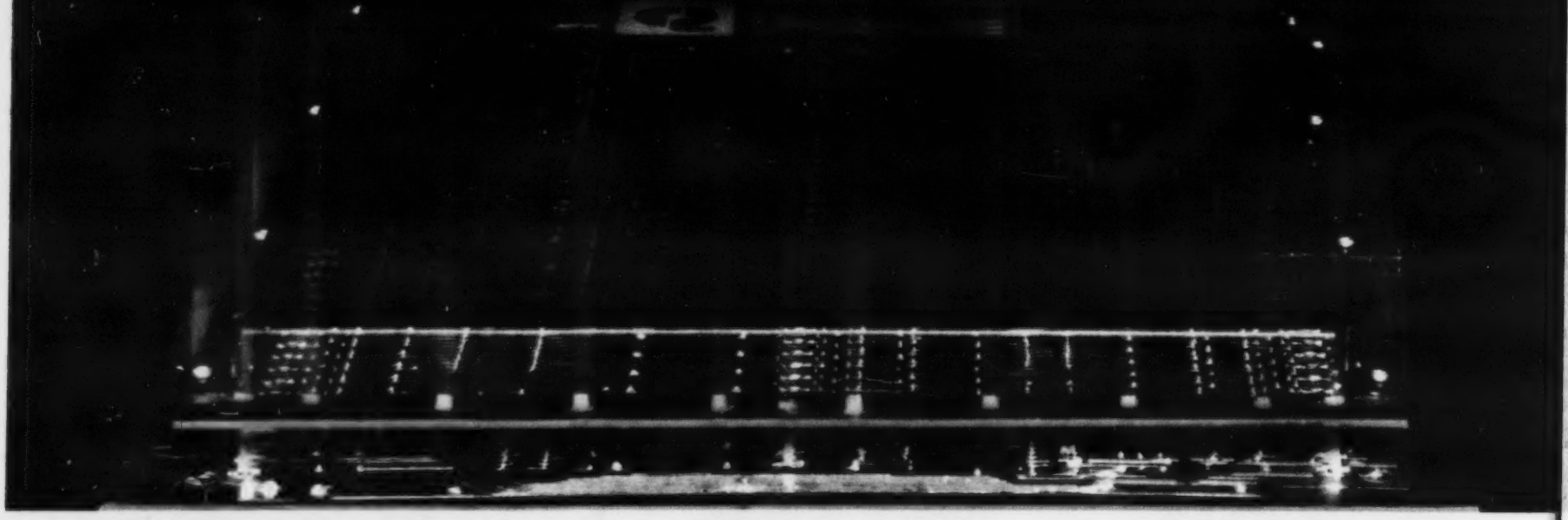

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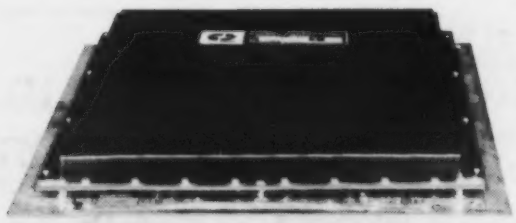

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Components, User Devices Prominent in SJCC Exhibits

By a CW Staff Writer

ATLANTIC CITY – The exhibit hall is twice the size, but "number one" and "number two" won't be there.

Next week's Spring Joint Computer Conference (SJCC) here will host about 190 exhibitors showing $200 million worth of their latest innovations in computer hardware, software and services, even though IBM and Honeywell have opted to "display" their wares in media advertising rather than trade shows.

Although a year-old restriction on the maximum number of booths (1,000 is tops, each being 10 ft by 10 ft) is still in force, that maximum is safe from possible conflict, as 600-plus booths have been reserved.

The exhibitors not showing mainframes will display I/O devices, peripheral equipment, some special purpose systems and source data collection devices.

Services

There also will be consulting services on "display," along with time-sharing and software services, data communications and conversion equipment, COM gear and services, and test equipment.

Additionally, 15 exhibitor organizations will supplement their displays through the presentation of corporate papers covering new products and services.

Calling the JCCs "the most important meetings" in the computing field, sponsor Afips has predicted about 30,000 will attend the spring event.

The organization has even reinstituted an exhibits-only fee to make it easier for the less technically oriented visitors to see the equipment and services on display.

Analyze Innovations

While technical exhibits are an integral part of the conference, the exhibit floor provides a unique opportunity to analyze the availability, operational characteristics, practicality and economic value of new innovations.

Conference regulations do not permit "sales" to take place on the floor, but the purpose of these state-of-the-art exhibits is to allow users to conduct their own comparisons, obviously for possible later purchase.

The JCCs are the largest "computer" exhibitions, Afips has pointed out, with "computer-related equipment" coming into the category.

Although the spring and fall conferences normally draw different audiences since they are held on the opposite coasts, developments in the industry occur so fast that new products are often not repeated . . . they are replaced.

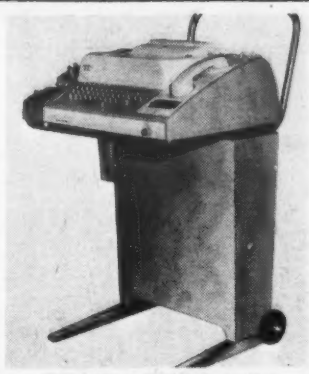
Several companies will be introducing new systems or devices at the SJCC, or will be exhibiting previously announced items for the first time. Many of these companies will be found in the following section devoted to the products on display at SJCC '71.

Comdata to Show Multiplexers

ATLANTIC CITY – The Comdata Corp. exhibit is expected to include Series 200 frequency division multiplexers, Series 300 data sets and Series 33 terminals from Teletype Corp.

The multiplexers are said to provide equal opportunity access to multiple drop channels, without requiring high-speed modems. The system, with local and remote stations, costs $1,440 for the first channel plus $610 for each additional channel.

The low-speed Series 300 data sets are compatible with the Bell System 103, and are available in hardwired or acoustically coupled models, from $100 to $350 in cost.

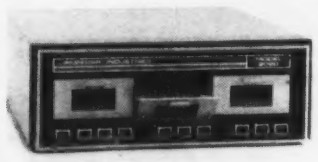


TTY With 301P Data Set

Comdata Corp. will occupy booth 1721.

Canberra Unveils Cassette Unit

ATLANTIC CITY – Canberra Industries plans to show the Model 2020 Cassette Tape Transport System, designed to provide the minicomputer user with three independent cassette loaded magnetic tape drives, a tape drive controller, a complete interface and software support.



Canberra Model 2020

The transport is said to feature simultaneous reading and writing on separate decks, backspace record capability and high-speed bidirectional search for addressable files.

Interfacing is accomplished by changing a single circuit card and cable inside the unit. Several interfaces are available.

Software support for each minicomputer includes cassette-oriented Assembler, Editor and Utility programs all of which recognize the Model 2020 as a source and destination for data. Canberra Industries, Inc. is at booths 1617, 19.

'Graf-Pen' Eliminates Joystick

ATLANTIC CITY – Science Accessories Corp. is expected to demonstrate the spark-gap Graf/Pen and associated data tablet that allows the user to enter formatted or graphical data without the use of a keyboard, "mouse," "joystick" or other mechanical tool.

The data tablet digitizes the coordinates of the Graf/Pen's position, based on spark-gap noise readings made by microphones along the edge of the tablet. The standard ballpoint mechanism of the Graf/Pen allows the user to create his own hard-copy record of the input as it is being digitized, the company said.

Science Accessories Corp. is at booth 1190.

Digi-Data Has Mini Tape Unit

ATLANTIC CITY – Digi-Data Corp. is planning to display the Mini-Dek digital tape unit designed for use with minicomputers and small-scale systems, as well as two systems for working with MT/ST output. The Mini Dek is available in 7- or 9-track models, with recording densities of 800 and 1,600 bit/in.

The System 30 MT/ST to computer tape converter is said to convert cartridges in appoximately four minutes, without tying up either the computer or the MT/ST. The Model 3000R is an MT/ST reader designed to interface with minicomputers. It can be used in graphics and other text systems, the company said.

Digi-Data Corp. will occupy booth 1560.

Licon Offers 'N' Key Rollover on Keyboard

ATLANTIC CITY – Licon, Division Illinois Tool Works, Inc., expects to show a "fail-safe" N-key rollover option on the firm's line of general-purpose keyboards.

In operation, the Licon system completely isolates each key in terms of travel or speed of actuation. Each key transmits its specific signal in exact sequence, regardless of whether the preceding keys are still depressed or in return travel.

The keys are said to require very little power, yet provide high-level output with outstanding signal-to-noise ratio. The keyboards are essentially immune to temperature changes, vibration, voltage variation, etc, the company said.

Available options include shift, shift lock, parity encoding and internal strobing.

Licon will be in booth 2142.

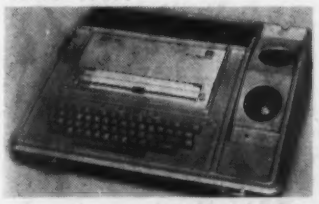
TI 725 Terminal Designed for T/S

ATLANTIC CITY – A new addition to the "Silent 700" Electronic Data terminal line from the Digital Systems Division of Texas Instruments, Inc., the Model 725 Portable Data Terminal will be shown. It is designed for time-sharing users, and features a built-in acoustic coupler.

Designed for quiet and reliable high-speed printing, the Model 725 terminal employs MOS/LSI integrated circuitry and TI's silicon-integrated circuit printhead. For maximum reliability, "Silent 700" terminals have been designed to use a minimum of moving parts, eliminating wear elements common to conventional teleprinter terminals.

TI also plans to show its Series 934 magnetic tape transports and 9803 magnetic tape controllers for use with systems 360 and 370.

Texas Instruments will be in booth 1505.



Texas Instruments Model 725

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CCI Booth Features Communicator, CRT

ATLANTIC CITY – Computer Communications, Inc. of Culver City, Calif., will include in its exhibit the CC-355 Totelcom CRT Display Terminal, CC-70 Computer Communicator, CC-30 Communications stations and CCI-7000 Communications Processing System.

The Totelcom is a portable, self-contained CRT terminal interchangeable with Teletype Models 33 and 35. It is designed to replace these units in communications networks without hardware or software changes.

The CC-70 is a high-speed front-end communications control system that directs the interchange of data between remote terminals and a wide variety of computer systems, relieving the computer of tasks associated with line handling and control, polling, queuing, character and message assembly/disassembly and buffer handling.

The CC-30 is available in both black and white and color models and is intended for use as a low-cost I/O terminal for high-speed on-line access to a computer.

The CCI-7000 (formerly the Intelcom I-7000) is an integrated communications processing system that operates as a store and forward message-switching system in a free-standing mode.

CCI will be in booth 2537.

CC70 Communicator

STC to Exhibit Radial Tape Unit

ATLANTIC CITY – Storage Technology Corp. expects to demonstrate its IBM-compatible ST 3400/3800 Radial Tape Subsystem.

The subsystem features monolithic technologies, read only memory control and programmable maintenance memory.

SJCC

Integrated tape switching allows up to 16 tape drives to be switched between four tape control units.

Tape speeds range from 75 in./sec to 200 in./sec with corresponding data rates from 15 kbit to 320 kbit.

STC will be in booth 2307 and 2309.

Singer Shows COM Plotter/Printer

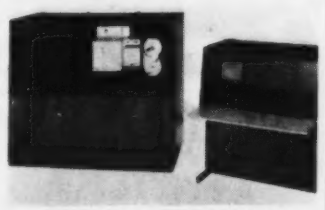
ATLANTIC CITY – Singer Micrographic Systems said that it will display its Model 6020 expandable computer output microfilm plotter-printer. The Model 6020 features a digital controller with 1 μsec cycle time, 24 bit word size, 8K word memory, complete operational software and a line of peripherals.

Primarily a graphics plotter with page-printing and composition capabilities, the Model 6020 converts computer-generated data into alphanumeric characters or graphical plots, which are displayed on the face of an ultra-high-resolution CRT and then recorded on microfilm.

The system is said to be well suited for business graphics, charts, composition of line-printer printimage tapes, and engineering scaled drawings.

The Model 6020 features a real-time, general-purpose computer which provides for stand-alone micrographics capabilities.

Singer is at booth 1713.



Singer MS-5000/MS6020

Sangamo to Display 4,800 bit/sec Modem

ATLANTIC CITY – Sangamo Electric Co. plans to introduce three new Sangamodems. The 4,800 bit/sec T4800 is said to offer end users unique modulation and error checking.

The C202CSC OEM modem is designed to provide 1,200 bit/sec capability on a single PC card, with EIA or TTL interface and CBS and CBT data coupler compatibility. The 300 bit/sec T103GSB is four DDD application via CBT coupler.

Sangamo is at booth 2507.

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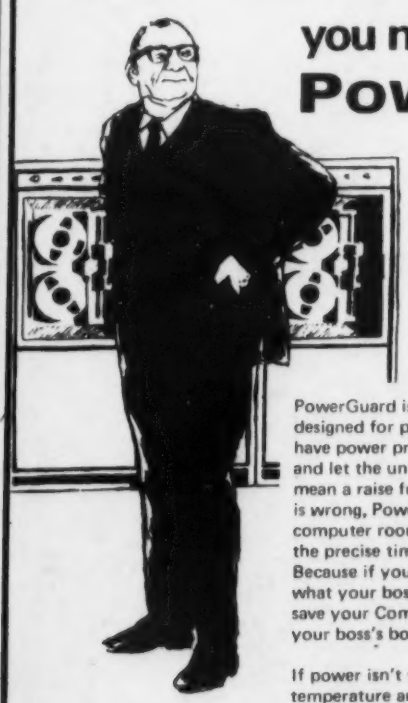

PowerGuard is a complete high speed analysis system designed for people with bosses who don't think they have power problems. All you do is plug it in, sit back, and let the unit show how smart your boss is. That could mean a raise for you. But on the slight chance your boss is wrong, PowerGuard will record all your plant's or computer room's power malfunctions clearly showing the precise time each occurred. That's even better for you. Because if you really do have a power problem instead of what your boss presumed was faulty equipment, you'll save your Company time and money. That will impress your boss's boss. Maybe then you'll be your own boss.

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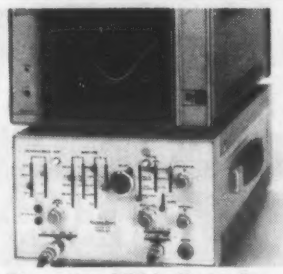
Biomation Unveils A/D Recorder

ATLANTIC CITY – Biomation Corp. of Palo Alto, Calif. is slated to introduce the Model 802 transient recorder which utilizes a high-speed, 8-bit analog-to-digital converter with a 1K word MOS shift register memory to capture and hold the digital equivalent of an analog signal as a function of time.

The 802 can also be used as a high-speed peripheral data-gathering instrument and input buffer memory for a digital computer, the company said.

Biomation will show the 802 at booth 1337.



Biomation 802 in Operation

Opscan Mark Readers Collect Data, Can Scan Different Sheet Sizes

ATLANTIC CITY – The Opscan 12 and Opscan 17 low cost, low speed, optical mark readers that can be used as data collectors will be at the Optical Scanning Corp. display, the company said.

These scanners incorporate all the features of the company's current product line. In addition they are said to have the capability of scanning many different sheet sizes. They also incorporate the hand-print capability, so that numerics can be hand or pre-encoded on forms and then scanned.

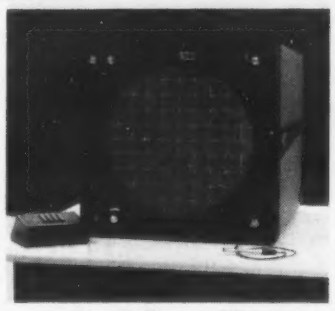
Opscan/12 Mark Reader

First production models delivery on both systems are scheduled for July. Optical Scanning Corp. will be at booth 1838.

Lundy Exhibits Graphic Display

ATLANTIC CITY – Lundy Electronics & Systems Inc. expects to introduce system 32, a high performance, computer interactive graphic display system for use with large computers and minicomputers.

System 32's capabilities are said to accelerate the decision-making process, where large amounts of complex data are involved, by providing precise, high-speed visual computer output and interaction.



Lundy System 32

System 32's modular design permits customer selection of specific capabilities and options most suited to his particular requirements.

System 32 ranges in price from $60,000 to $100,000 dependent on options, and can be seen at booths 2438 and 2436.

Facom Printer Combines With CRT

ATLANTIC CITY – Fujitsu Ltd. plans to introduce its new hardcopy printer for alpha-numerics and graphics which works in combination with any CRT display unit.

The new machine, the CRT printer Facom 6451A, features the first electrostatic deflection system with a new slave CRT boasting fine resolution and high contrast. This system directly utilizes X, Y and Z signals of the master display to make the slave image which is electrophotographed through a compactly designed optical system. Operation speeds average 8 sec/sheet (15 sec for the first copy) including 5 sec average exposure time. Fujitsu will be in booths 1622, 24.

SJCC

Facit to Demonstrate Small Digital Printer

ATLANTIC CITY – A new digital printer, the Facit 4501, is among the OEM products and data systems being shown by Facit-Odhner, Inc.

The printer, which will be demonstrated in booths 1943-45-47, is a highly compact device consisting of a solenoid unit, timing unit and printing unit.

The Facit 4501 operates at 3.5 line/sec with a maximum capacity of 20 columns, 12 or 17 char/column.

Facit is also displaying and demonstrating its Series 6000 and 6200 Modular Data Systems for typewriters, adding machines and bookkeeping machines, which simultaneously produce hard copy plus magnetic or punched paper tape.

Facit 4501 Digital Printer

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These characters illustrate only a few of the elegant, distinctive type faces you can select on the Bright Industries' BI 1215 Bar Printer. Bodoni, Century, Cooper, Futura, Franklin – each imparts its own flavor to a faultless printout.

These characters print crisply, cleanly at 300 lines per minute, with a precision no other line printer can approach. The BI 1215 accommodates fonts of 64, 96 or 128 characters, up to one-quarter inch high; fonts can be changed in the field in minutes.

These characters print with such an exact vertical and horizontal alignment that the BI 1215 can go back to overprint, underline or add phonetic symbols. Only an oscillating bar printer with an individual hammer for each column can achieve a printout so exceptional you'd be proud to sign your name to it.

These characters permit you, through your selection of typeface, to express the lifestyle of your company in every communication, in a way never before possible. With the Bright Industries BI 1215 Bar Printer, computer printout comes of age.

"Visit Booth 1219 at the SJCC"

These characters were brought to you by the Bright BI 1215 Bar Printer, shown on the right. There's nothing else like it in the world. Please write for full information.

Bright Industries Inc.
One Maritime Plaza, San Francisco • 94111
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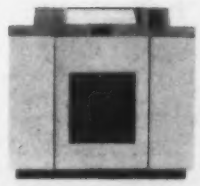
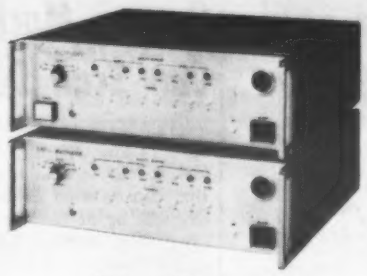


Bright
INDUSTRIES INC.

I/Onex Data Units Shown in Operation

ATLANTIC CITY – The I/Onex Division of Sonex, Inc. expects data communications equipment to be in operation between a time-shared computer in Philadelphia and its booth at the SJCC.

Products to be shown include the Model 116A time-division multiplexer, Model 31 Data Coupler and Model 41 Data Access Unit.



I/Onex Multiplexer

I/Onex said that the 116A can handle up to 16 data channels over a single, full-duplex, voice-grade line.

Odec to Show Line Printers

ATLANTIC CITY – Odec Computer Systems, Inc. plans to exhibit for the first time its models 1321 and 1322 medium-speed line printers.

The 1300 series printers print 132 columns at speeds from 100 to 250 line/min. They offer up to a 96-character set, with individually removable characters. The price of the 1300 series printers is $4,740 in OEM quantities of 100.

Odec will exhibit at booth 2144.

Computek Exhibit Features Series 500 CRTs

ATLANTIC CITY – Computek Inc. plans to exhibit Series 500 low-cost CRT interactive graphics systems, featuring bright-image display, selective erase, unlimited display capacity for vectors, curves and alphanumerics without flicker and grey scale gradations.

Series 400 graphics terminals, companion to the Series 500, using high-speed, high-resolution DVST, will also be shown, the company said.

Other Computek units include the Model 100 interactive alphanumeric CRT terminal.

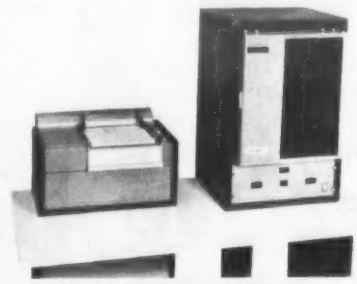
The Computek exhibit will be in booths 1626 and 1628.

Gould 4800 Prints Alphanumerics, Graphics

ATLANTIC CITY – Gould Inc. will exhibit its Gould 4800 Off-Line Printer/Plotter System in booth 1133.

The system consists of the Gould 4800 Electrostatic Printer/Plotter with either an 8-1/2 in. or an 11 in. paper width; a 9-track, 800 bit/in. magnetic tape handler; and an interface/control unit. The system produces both alphanumerics and graphics, separately or together.

Standard software includes a character generator package to emulate standard line printer formats. The basic Gould plotting package facilitates formatting commonly used plotter graphics such as charts, perspective drawings and contours.



Gould 4800 Printer/Plotter

Litton Shows Readers

ATLANTIC CITY – Four readers for punched paper tape, punched cards and edge-punched cards are expected to be shown by Litton Automated Systems, OEM Products.

The Series 1300 Punched Paper Tape and Edge-Punched Card Reader accepts

SJCC

tapes up to 1 in. wide and cards up to a fan-fold width of 210 mm and reads them at 200 char/sec, Litton said

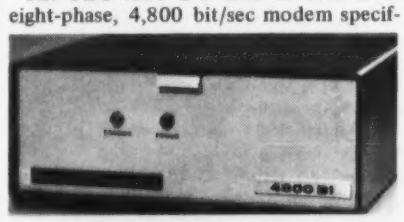
Series 1100 Punched Card and Edge-Punched Card Readers read punched cards at 200 char/sec and edge-punched cards with character-tone stop at 175 char/sec.

The firm is at booth 2315-17.

Penril Offers Modems

ATLANTIC CITY – Penril Data Communications plans to exhibit two new modems at booth 1345.

The PDC-4800 B-1 data modem is an eight-phase, 4,800 bit/sec modem specif-



Penril PDC-4800 B-1 Modem

ically designed for a full duplex polled system on C2 conditioned lines.

The PDC-2000 A is a direct replacement to the Bell 201 A. This four-phase modem offers synchronous operation at 2000 bit/sec over the dial-up network in a half-duplex mode. It is designed to operate with the F 57951, F 58118, CDT, CDR, CBT, 1000 A or the 1001 B Data Access Arrangements.

Inforex Options Include Tape Package, 1401 Printer

ATLANTIC CITY – Inforex, Inc. expects to exhibit its Intelligent Key Entry System in booth 2237.

Optional features to be shown include the 1401 Printer with 132 print positions, operating at a rate of 200 line/min and Expanded Tape Processing.

The basic Intelligent Key Entry System is a multistation, shared-processor, data entry system. It permits direct entry of data from up to eight keystations into a central control unit, where data is stored, edited and verified on a disk before being transferred onto magnetic tape for processing in a host computer. Each of the system's stations includes a solid-state keyboard and CRT display mounted on a desk.

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DEADLINE! is a true management tool that represents a philosophy that all computer center managers are working toward.

To learn more about DEADLINE!, register for the free seminar in your area. Write or call Dr. Leon W. Transeau, Vice President, Synergistic Cybernetics, Inc. 7777 Leesburg Pike, Falls Church, Virginia 22043, phone (703)893-2500.

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26	Philadelphia
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June 1	Raleigh-Durham
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3	St. Louis
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Bucode Exhibits 3 Tape Drives

ATLANTIC CITY – Three high-performance fully automatic loading magnetic tape systems for OEM, the Models 20291, 20292, and 20293, will be displayed by Bucode, Inc.

The 20291, 20292 and 20293 transports are automatic loading high-speed drives that operate at speeds of from 75-120 in./sec, 120-150 and 152-200 in./sec respectively. Available with read/write electronics for 800 bit/in. NRZI, 1600 bit/in. phase-encoded, and dual (800/1600 bit/in.) density recording, they offer transfer rates to 180 kHz, 240 kHz, and 320 kHz respectively.

The company will also demonstrate its low-speed Model 2045. The 2045 offers industry-compatible tape recording at tape speeds to 45 in./sec and packing densities to 800 bit/in. (NRZI) and 1600 bit/in. (P.E.). The drives will be shown in booths 2337 and 2339.

Bucode Tape Transport

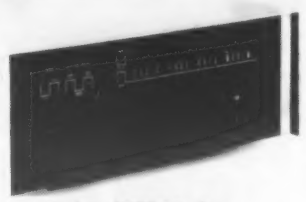
Codex to Demonstrate Full-Duplex TDMs, 4,800 bit/sec Data Modem

ATLANTIC CITY – Codex Corp. is expected to display operating examples of its main commercial product lines at booth 1153.

The Codex TM-8 is a full duplex time-division multiplexer designed to serialize multiple independent data speed digital streams for transmission by the Codex AE-96 high-speed data modem.

The Codex 4800 Data Modem, featuring automatic and adaptive equalization, is designed to operate at 4800 bit/sec over unconditioned telephone circuits.

The Codex 800 Time Division Multiplexer Series is a character interleaved multiplexer, designed to meet the demands of data communications systems employing mixed speed asynchronous data rates from 45 to 1,800 bit/sec.



Codex 4800 Modem

Auricord CAS-20's Speeds Variable

ATLANTIC CITY – Auricord Division of Scovill's digital cassette deck, the CAS-20, is expected to be shown in booth 2424.

The CAS-20 is a lower-cost version of the CAS-10 digital cassette deck. Features include single direction read/write from 1.5 in./sec to 15 in./sec with dual direction search from 40 in./sec to 400 in./sec. All speeds are electrically adjustable.

The CAS-20 has three 10,000 hour rated life brushless dc motors and cassette in-place and file-protect sensors. A high inertia flywheel system is used for rapid damping of tape speed variations.

SJCC

ISS 715 Stores Up to 58 Mbytes

ATLANTIC CITY – The ISS 715, a new disk drive with double the storage capacity of conventional units, will be exhibited by Information Storage Systems, Inc.

The ISS 715 offers a storage capacity of 58 million bytes using 406 cylinders on a standard 2316 disk pack, and will be marketed as an OEM product to computer systems manufacturers.

Information Storage Systems will be in booth 1239.

ISS 715 Disk Drive

There are a lot of mini-computers around today. One of them is the runaway favorite.

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WHAT'S AHEAD for the computer industry in the 1970's, as the recession draws to an end?

HOW WILL the mainframe builders fare? The independent peripheral makers? The crowded service and software industry?

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EDP industry report

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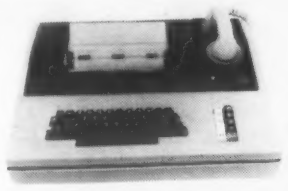
Tracor Presents 1601 Terminal

ATLANTIC CITY – The TDS-1601 conversational terminal, being shown by Tracor Data Systems, Inc., features an impact print-head mechanism which prints a 64-character Ascii subset at 10 or 15 char/sec.



TDS-1601 Terminal

A replacement on a plug-for-plug basis for the Model 33 or 35 Teletypewriter, the printer is interfaceable on either a serial EIA standard RS 232B, 20 mA or 60 mA current loop or parallel basis. The TDS-1601 can be acoustically coupled to a regular telephone handset or hardwired to the appropriate telephone circuit using a Bell System Data Access Arrangement (DAA).

TDS will exhibit in booth 1219.

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Panasonic Exhibits Static Card Reader

ATLANTIC CITY – A simple, static card reader for Hollerith-coded cards and badges will be introduced by Panasonic at booth 2123. Available in either horizontal (CU 100HC) or vertical (CU 100VC) configurations the models operate on a low-level light source which activates extremely sensitive diode-isolated sensors.

The static card reader is available in sizes ranging from the standard 10 by 10 Hollerith punches up to 12 by 80. Insertion is manual, and a combined mechanical and electro-optical system prevents improper insertion.

Digitronics Displays Line of Peripherals

ATLANTIC CITY – The complete line of I/O peripheral products manufactured by Digitronics Corp., including perforated tape punches, photoelectric and mechanical tape readers and handlers, magnetic tape handlers and the new Model 2030 Perforated Tape Reader, will be featured at booth 2117.

With only a single moving part, a stepping motor, the Model 2030 reads at 300 char/sec asynchronously, and at 400 char/sec synchronously. It has no pots to adjust and requires no lubrication.

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Quadri to Show Ferrite, Semi Memories

ATLANTIC CITY – The "Q Core" memory system is to be shown by Quadri Corp. of Phoenix, Ariz.

The "Q Core" storage element, an open-loop ferrite rod, gives high-speed random access. Access time is 75 nsec and total cycle time is 200 nsec, making it compatible in speed to the faster bipolar semiconductor memories.

A series of semiconductor memory systems, specifically designed to provide an intermix of high speed, standard speed and ROM Memory in one standard Retma card rack will also be shown.

Called the "Compatibles," the system consists of the Quadri Model 809-01 Programmable Read/Only Memory, the Model 811-01 Bipolar Read/Write Memory System and the Model 811-02 MOS Read/Write Memory System.

The Model 811-02 MOS Read/Write Memory System is a large capacity, high-speed memory system specifically designed for mainframe memory applications.

The nanoprogrammer, a ROM designed to assist in the evaluation of newly developed micro programs, or other high speed subroutines contained in hard-wired logic or ROM.

The Quadri Corp. will be at booths 1409-11.

Would you buy it without going inside?

If anybody offers you a price that looks better than ours, you'd better make sure you know exactly what you're getting.

We've just built a low-priced FDM data transmission system that's the best value on the market: the GTE Lenkurt model 25C. Go inside and take a look around . . . you'll find intermixable speeds from 110 to 600 baud. You'll find a built-in 20 mA local telegraph interface for on-premises printer applications. You'll find local/remote test features and a built-in carrier alarm lamp. You'll find it meets TTL, S-level and EIA/CCITT interface standards. And you'll find all the quality and precision we've been known for during 25 years of building data transmission systems.

The 25C comes as an attractive single-channel subset. Or the same duplex channel unit can be shelf mounted — up to 8 channels per shelf with a maximum of 18 channels (110 baud) on each VF line. So it lets you use just one voice channel rather than a lot of data lines. And it lets you do it at a very reasonable price. Add to that the 25C's economy of maintenance and you end up with a bundle of savings.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Bendix Launches Datagrid X-Y Plotter System

ATLANTIC CITY – Bendix Computer Graphics will exhibit in booth 1213 two Datagrid digitizers, one Microfilm Plotter System and a new Flatbed Plotter/Digitizer.

SJCC

The Datagrid digitizer has been exhibited at previous computer conferences, but this year will be the first public showing of a Datagrid digitizer with magnetic tape recorder and teletypewriter output on a single system. Bendix will also exhibit a Datagrid digitizer connected via telephone line to a computer, and this digitizer system will be demonstrated solving engineering problems and design calculations.

The Bendix Microfilm Plotter will be shown with magnetic tape input. Included in the system will be a Bendix minicomputer, and the display scope for previewing data. The Microfilm Plotter can output finished aperture cards.

Bendix Plotter System

The new item in the Bendix exhibit will be the Datagrid X-Y Plotter/Digitizer. The X-Y Plotter utilizes the measuring capabilities of the Datagrid digitizer. The system will have input via paper tape reader. The digitizer portion of the plotter will output to an ASR-33 teletypewriter with paper tape punch. This system is ideally suited for interactive design, Bendix said.

Kybe Shows Tape Cleaners, Testers

ATLANTIC CITY – The Kybe Corp. plans to exhibit its line of tape and disk maintenance equipment.

The Kybe TMS-70 magnetic tape cleaner/tester precision rewinder, a total tape maintenance system in a table-top unit; the Kybe TMS-200, a magnetic tape certifier designed in price and performance for the computer user; the Kybe TC-10, a low cost magnetic tape cleaner, featuring precision rewinding and a cleaning blade made of an extremely durable man-made sapphire; and the Kybe DP-20, the first automatic disk pack cleaner, a compatible unit for both high and low stacks, will be shown in booths 1186-1188.

Kybe TMS-70

EA to Introduce 9 MOS Registers

ATLANTIC CITY – Electronic Arrays is scheduled to introduce nine of its MOS shift registers in silicone-molded packages. The line includes a quad 32-bit register, 1- to 64-bit variable length register, a 256- and 512-bit register – all dynamic; and a dual 100-bit static register.

The registers have the same guaranteed electrical characteristics as EA's hermetically sealed registers specified over 0°C to 70°C temperature range, the company said. They will be shown at booths 2643, 44, 45.

Mohawk Labs Exhibits 4000 Random Filing

ATLANTIC CITY – Mohawk Industrial Laboratories, Inc. will exhibit the System 4000.

The System 4000 permits cross-reference selection of information stored in unlimited quantities on tab card-size, randomly filed documents. One document or a group of documents can be retrieved in six seconds. The random filing feature reduces refiling time, eliminates filing errors. The system will be shown at booths 1866, 1868.

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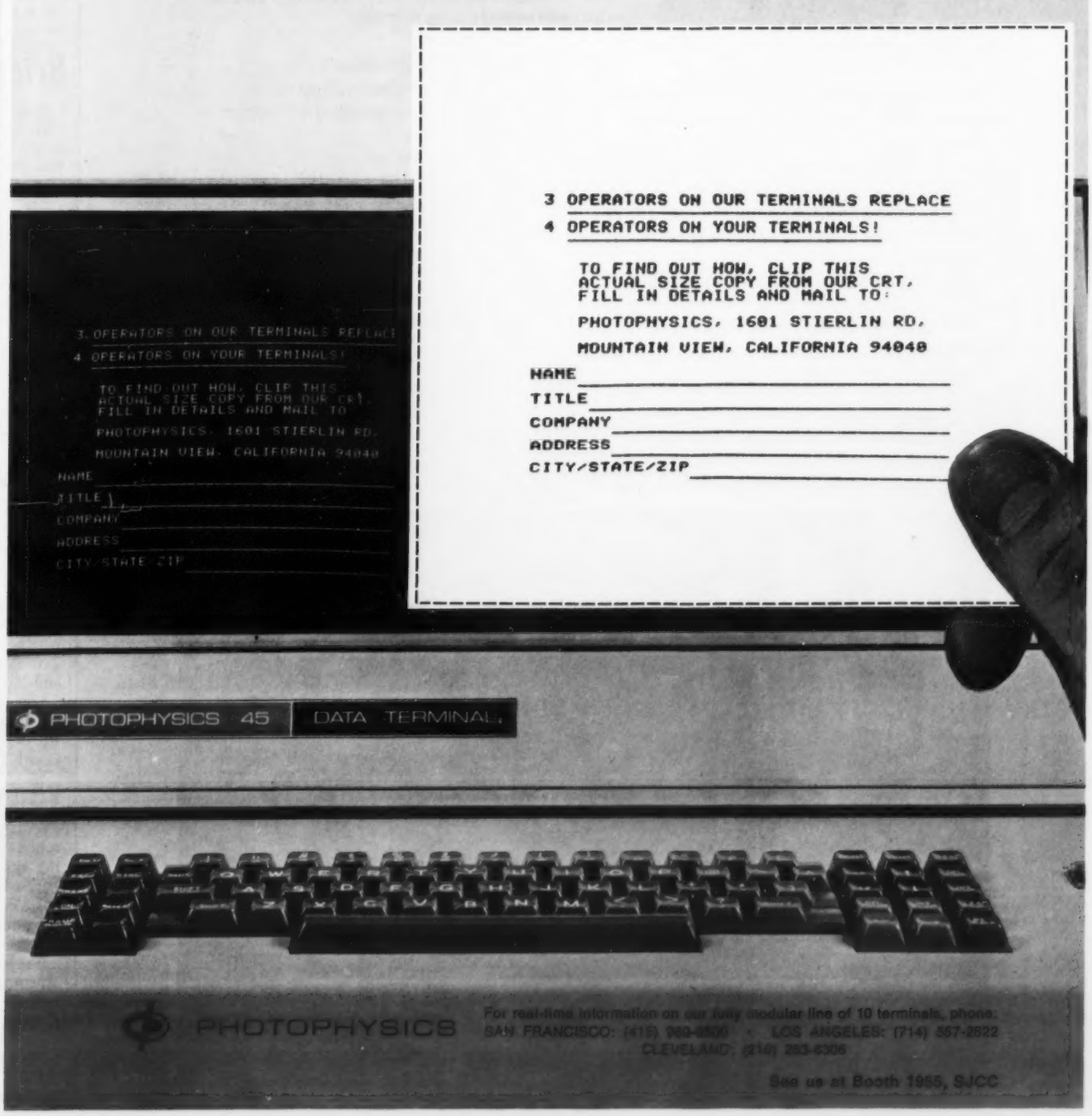

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See us at Booth 1955, SJCC

Delta Data Displays Batchterm Terminals

ATLANTIC CITY – Delta Data Systems Corp. plans to show Batchterm terminals and Multiterm multiplexers.

Batchterm 1, a display terminal with cassette recorder and an impact printer, can work on-line or in a local environment, allowing information to be prepared locally, and pooled to a computer on an unattended basis.

The impact printer may have various type fonts, and a platten feed. The upper/lower case capability of the display and the impact printer is said to make it useful as an automatic letter writer, or text editing machine.

Delta Data Terminals

Multiterm 1, a multiple terminal controller, is said to allow 95 devices to use a single phone line. Delta Data will have Telterm displays and a 165 char/sec impact printer working with Multiterm 1, at booth 1139.

Boole & Babbage Shows Measurement Engine

ATLANTIC CITY – Boole & Babbage, Inc. plans to show its system of hardware measurement products, the Measurement Engine.

This hardware system augments the measurement capabilites provided by Boole & Babbage's line of software measurement tools and is designed to provide DP management with an economical, easy-to-use, yet sophisticated measurement tool to assist in the identification and reduction of computer performance problems.

By applying the concepts of installation calibration and continuous performance monitoring, the Measurement Engine is able to provide the user with timely information with which he can solve computer performance problems.

Boole & Babbage's booth is 1520-22.

Boole & Babbage ME-1011

Xerox 7000 Makes Output 'People Size'

ATLANTIC CITY – Xerox Corp.'s Business Products Group will occupy booth 1623. The display will feature the Xerox 7000 Reduction Duplicator which produces "people size" reproductions from computer output.

A Copyflo Continuous Printer Model 1-40 will reproduce computer-generated microfilm at speeds of 40 ft/min.

The Xerox microprinter which acts as a microfilm printer or copier, a continous Forms Printer, a Telecopier telephone facsimile transceiver and microfilm will round out the display.

Wiltek 500 Uses CRT

ATLANTIC CITY – A terminal designed for corporate communications networks will be demonstrated by Wiltek, Inc. The base of the terminal contains two Wiltek Buffer-Stores which allow the terminal to automatically send and receive at speeds up to 2,400 bit/in. without interrupting data entry.

The terminal is being offered initially with a choice of two data entry devices: the Wiltek 300 employs a Teletype Model 33 KSR with additional character and line delete features. The Wiltek 500 utilizes a CRT with a 2,000-character display and formatting and editing features.

Wiltek 300

It is priced at $3,900 and can be seen at booth 1419-1421.

Why Wait to Emulate?

With Computer Technology's new DUO/360/370, you can run most DOS object programs under OS right now with no conversion of the object program.

Here are the specifics:

Fifteen DOS and/or OS jobs may run concurrently from one or more OS job streams (even RJE), and *jobs may have both* OS and DOS steps;

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DOS programs may have spooled input and output data sets (more than one of each!), *with forms and carriage* overflow control in spooled printer data sets;

DOS programs may share data sets with OS programs;

DOS programs may share direct access devices with OS programs;

DOS programs may be executed with catalogued OS JCL;

DOS programs may use STXIT OC, STXIT IT, STXIT PC, CHECKPOINT, the DOS Communication Region, and LUBs and PUBs;

DOS programs may access data sets via the OS data set catalog;

DOS programs may process non-standard label tapes, or (with no DOS *object* program change) allow an OS NSL routine to do the processing;

DOS programs may process user standard tape labels;

DOS program execution times can be accounted for by OS SMF.

Sound good?

Then find out all about it.

Call Computer Technology Inc. at (214) 638-7555. And ask for the Director of Corporate Systems.

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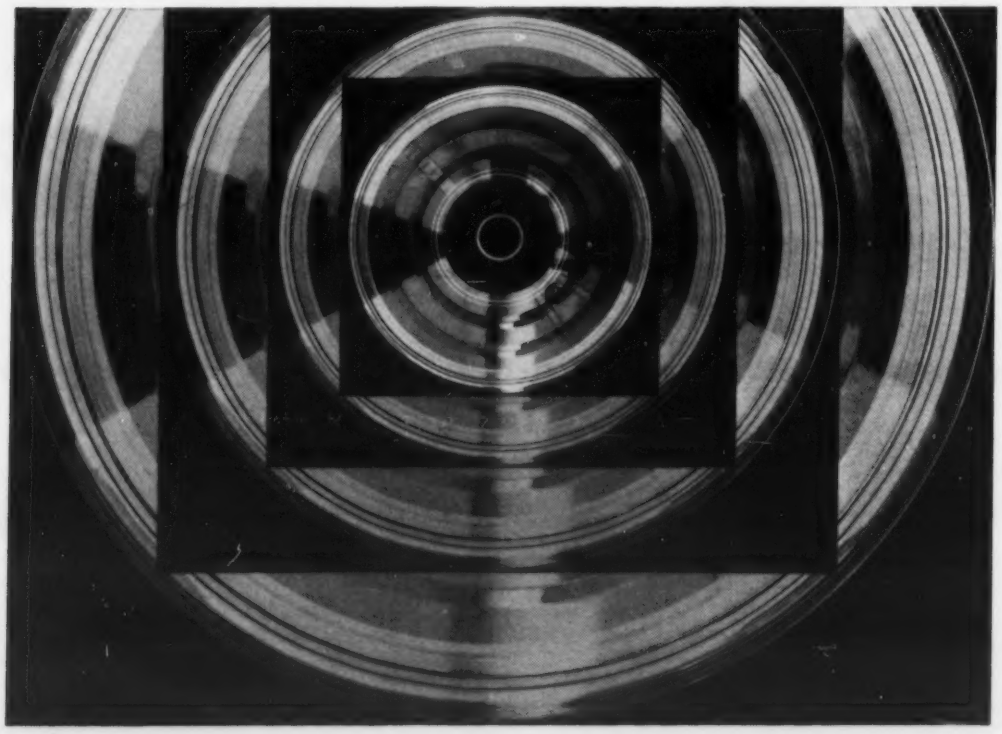


Bridge Offers 8096

ATLANTIC CITY – Two card readers that feed, read and stack the 96-column System/3 card as well as the standard 80-column card and its stub varieties will be featured by Bridge Data Products, Inc.

The Model 8096 reads on demand 80-column cards at 300 card/min and 96-column cards at 600 card/min. In OEM quantities it sells for $1,690.

The Model 8800 reads on demand 80-column cards at 650 card/min and 96-column cards at 1,000 card/min. This medium-speed card reader sells for $2,500 in OEM quantities.

Bridge Data Products is in booth 1559-1561.

ICC/Milgo Displays Variety of Modems

ATLANTIC CITY – International Communications Corp., subsidiary of Milgo Electronic Corp., plans to feature modems which transmit data over the dial-up telephone network as well as dedicated leased lines. Included in the ICC display will be Modem 2200/20 which transmits at 2,000 bit/sec; Modem 2200/24 which transmits at 2,400 bit/sec; and Modem 3300/36 at 3,600 bit/sec.

Low-speed modems for OEM use and other high-speed modems for operation up to 1 million bit/sec will be shown in booth 1249.

Visicon Digitizes Graphics

ATLANTIC CITY – Visicon, Inc. is scheduled to exhibit its automatic digitizing system for direct computer input of hard-copy information. This system is used in digitizing all kinds of graphic data including laboratory charts, drawings, maps and photographs.

The heart of the system, the Model GC-3 Automatic Graphic Conversion Terminal, will be exhibited as part of a hardware system which includes a keyboard, buffered digital magnetic tape recorder and a visual monitor. Samples of graphic information processed by Visicon's software packages will also be at booth 1979.

Data 100 to Demonstrate Three Terminals

ATLANTIC CITY – Data 100 plans to demonstrate three products from its Seventy Series of remote terminals.

These include the Model 70 Remote Batch Terminal, Model 73 Interactive Display Terminal and Model 78 Programmed Terminal.

The Model 70 terminals are plug compatible with the four models of the IBM 2780 Data Transmission Terminal.

The standard unit includes the terminal control unit, 300 card/min card reader, 300 line/min line printer, a choice of Ebcdic, SBT or Ansi line discipline, automatic answer/disconnect, point-to-point or multipoint line control, dual 400 character 7-record buffers and transmission rates of 2,000-3,600 bit/sec.

The units will be shown at booths 1134. 36, 38.

Data 100 Model 70

Timeplex to Exhibit SMC-200 Multiplexer

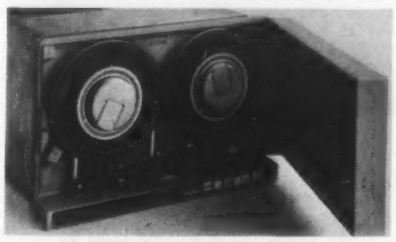
ATLANTIC CITY – Timeplex is slated to show its SMC-200 Serial Data Multiplexer which puts up to 32 channels onto Telpac, T1 or microwave transmission facility.

SJCC

The device bit interleaves up to 32 synchronous or isochronous data streams. Input rates of up to 400K bit/sec may be multiplexed up to group band, T1, Telpac or Mbit microwave transmission rates.

SMC-200s may be pyramided to multiplex hundreds of low-speed synchronous data sources such as start-stop character multiplexers, high-speed printers, CRT terminals, IBM 2780s, etc.

The units will be shown in booth 1664.



BI 2600 Synchronous Recorder

Bright Shows BI 2600

ATLANTIC CITY – A synchronous recorder on display in booth 1219, the new Bright Industries BI 2600 Magnetic Tape Unit, offers a compatible interface, easy operation and reliability.

It features a one-piece, rigid casting; IBM-compatible guides and geometry; capstan encoder control of timing and spacing; a phase-locked capstan-servo; and special negator springs that assure uniform tape tension.

Orbit/1 Processes Documents

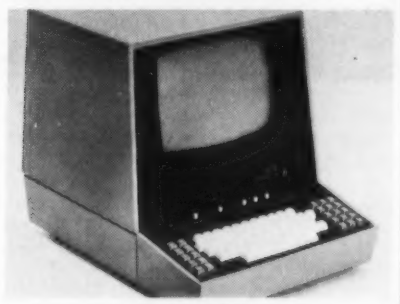
ATLANTIC CITY – Orbital Systems, Inc. plans to demonstrate a complete off-line document processing system at booth 1668.

High-speed printed turnaround documents will be scanned by the firm's Orbit/1 System, transmitted to industry-compatible magnetic tape, and then printed out in hard copy form.

Conrac to Introduce Conractor I/O System

ATLANTIC CITY – A product line for OEM applications is slated to be introduced by Conrac Corp.

The Conractor input/output system is a family of physical and logical modules which can be combined in varying groupings to meet both the stand-alone and cluster terminal configurations of most computer systems at low cost.



Conractor 401

The system modules are a video display, a keyboard, a unit controller, a serial distributor and a serial distributor expander.

Conrac will also introduce a new PIX-PAC series of low cost solid-state CRT displays for data applications. Computer-controlled, electromechanical "split-flap" displays for large audience viewing, and an extensive array of solid-state, monochrome and color small- and large-screen CRT displays will also be exhibited at booth 1513.

Memory Technology Offers ROM Designed for PDP-8

ATLANTIC CITY – Two Read-Only Memory systems products, an MOS ROM series and a PDP-8 minicomputer memory adjunct, are scheduled to be introduced at booths 1331-1333.

The MOS ROM complements Memory Technology's line of braid transformer read-only memories and permits customers to work with an MOS memory on a systems basis at a low cost. The MOS systems are compatible with the company's SMS and Nanorom systems.

The ROM, designed for present PDP-8/I and PDP-8/L users, provides up to 32K additional words of storage.

Video Systems to Display CRTs, VS-100 Inventron

ATLANTIC CITY – Video Systems Corp. expects to display its CRT-Data terminals and peripherals including cassette tape recorders and integral modems.

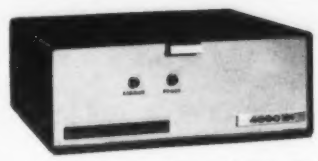
The firm also plans to display its VS-100 Inventron, a self-contained data entry and retrieval system composed of a desk-top video terminal screen with a standard keyboard.

The display is at booth 2301-2303.

a 4800 bps MODEM

PDC 4800 B

and another 4800 bps MODEM



PDC 4800 B1

Every company would like to have one outstanding product; that outperforms and outshines the competition in every respect.

Penril has two.

The PDC-4800B and the PDC-4800B1.

The 4800B has an automatic equalizer, a $3500 selling price, and an optional 300 bps reverse channel.

It was designed for point-to-point operation over dedicated lines. It does its job better than any competitive unit. It does its job so well that some of our customers are now using it as a dial line modem.

The 4800B1 costs $2800 and operates in point-to-point and multi-point polled systems.

A unique forward acting equalization scheme permits each drop to be individually and independently equalized to the central site, from the remote site in both data directions.

It makes for a better system.

If you would like to know more, give us a call.

We can send a Brochure, a Salesman, or a Modem.

SJCC Booth 1345

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Suite 107
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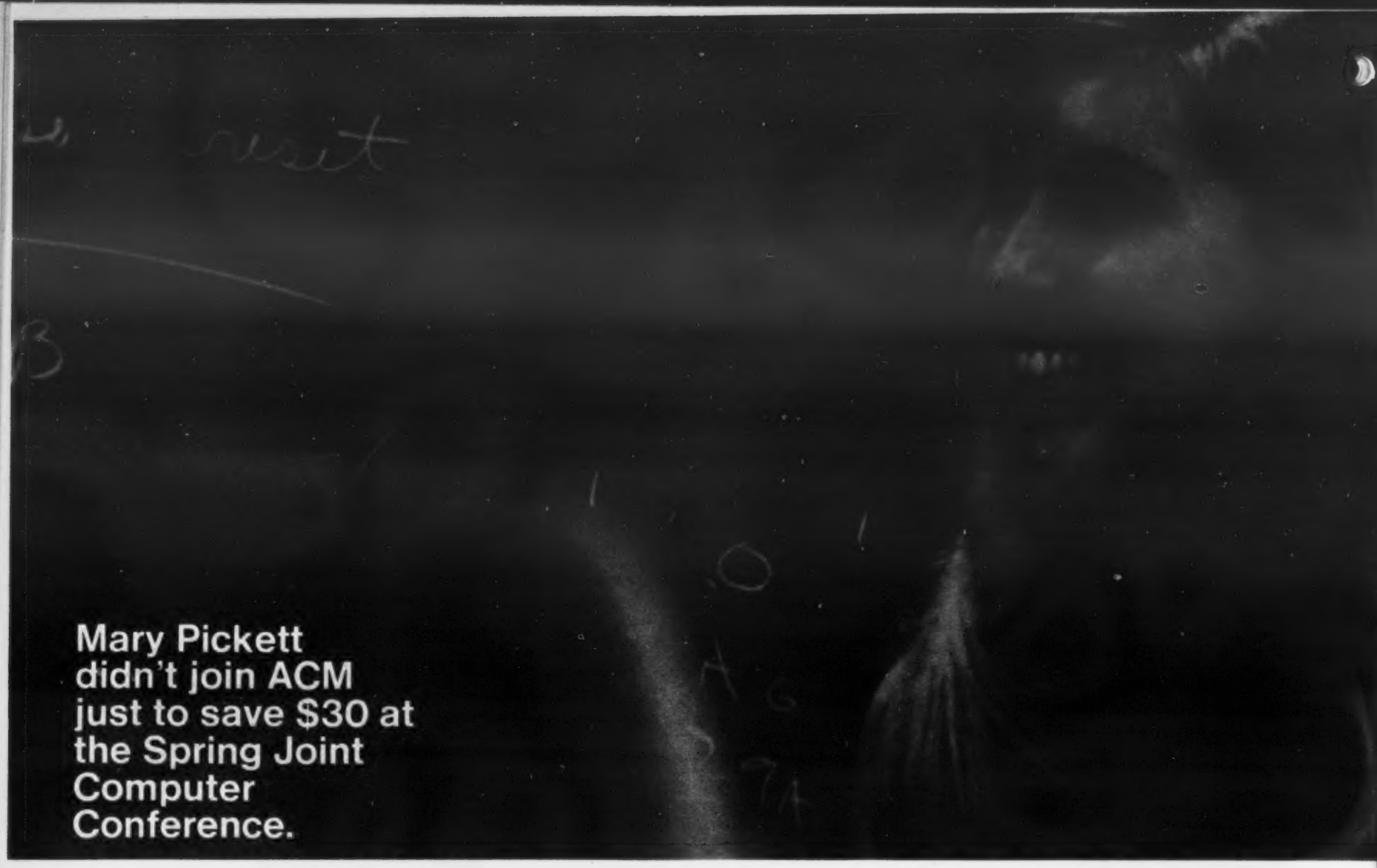
Ottawa, Ontario
613-728-3851

European representation by
Euro Network, Ltd.
28 Greyfriars Road
Reading, Berkshire
England RG1 1 NW
Tel. (0734) 585587'8

Penril Data Communications, Inc.

960 THOMPSON AVE. ROCKVILLE, MARYLAND 20852 301/881-8151



But it helped.

Mary Pickett is an associate systems programmer with RCA Computer Systems in Cinnaminson, New Jersey. Not too far from Atlantic City, site of this year's Spring Joint Computer Conference. She joined ACM in 1969, while a student at Purdue. With RCA since last August, she's getting involved in our Delaware Valley Chapter and recently switched from student to regular membership.

She's looking forward to the Spring Joint. "It's a chance to attend good lectures, see the exhibits and renew a lot of friendships," says Mary. "And my ACM membership helps. I save $30 on admission, more than enough to cover my annual dues."

ACM membership is a lot more than conference discounts. It's technical publications, lectures, seminars and special interest groups. A chance to get involved. And the professional pride of belonging to the oldest and most respected association in the computer field.

If you're going to the Spring Joint and don't belong to ACM, join now and save $30 at Atlantic City. Send in the coupon today!

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Potter Peripherals Include Print System

ATLANTIC CITY – The Potter Instrument Co., Inc., plans to demonstrate at booth 1647 its full line of peripherals designed for the user.

One of the highlights will be the DD 4314-1 disk storage drive with an access time of less than 30 msec designed to replace 2314 drives.

The system, consisting of eight drives plus a control unit, leases for $3,990/mo.

Shown for the first time will be the PS 3800 off-line print system.

Printing at speeds up to 1,500 line/min, this low-cost print system relieves the CPU of the printing operation, and thus increases the CPU's efficiency by increasing available computation time.

DC 5314 Control Unit and DD 4314

The LP 3403 Line Printer operates at 1,500 line/min and is a plug-to-plug replacement for the IBM 1403. It is totally compatible in interface with the IBM 1403, with equal print quality.

Also shown will be the line of magnetic tape units for IBM 360/370.

Potter plans to announce the first of its 6780 Series terminals, replacements for the IBM 2780 Series.

Digital Computer Plans Minicomputer Display

ATLANTIC CITY – Digital Computer Controls, Inc., plans to show for the first time two models of the D-112 12-bit and the D-216 16-bit general purpose minicomputer.

The D-112 was introduced last year to give OEMs a "second source" of supply for general purpose 12-bit minicomputers.

SJCC

The D-112 is said to be program-compatible with the DEC PDP-8 series.

The D-112H model has a solid-state bipolar and read/write memory, which can be mixed with a high-speed core memory.

The D-216 is program-compatible with the DEC PDP-11.

DCC is at booth 1737.

Ultronic Systems Plans Communications Line

ATLANTIC CITY – Data communication equipment planned to be displayed in the Ultronic Systems Corp. at booth 1666-68.

Included will be video terminals in both stand-alone use or in cluster contions, low- and high-speed data sets and both time and frequency division multiplexers including:

- The Videomaster 7000 Series of video terminals for stand-alone use of in cluster configurations of up to 24 units operating from a single controller.
- The Videomaster Hard-Copy Printer that operates at 30 char/sec, available as an option with Videomaster terminals.
- The four models of Ultronic data pumps data sets.

Vogue/Shepard Printer Designed for Mini Needs

ATLANTIC CITY – The Shepard Division of Vogue Instrument Corp. said it will show the 880E, a printer selling for $7,800 each and designed to meet minicomputer printing requirements.

It interfaces with the DEC PDP-8, Hewlett-Packard 2116, Varian 620 and Honeywell 316 and 516 and the Western Electric 201 and 212 data modems.

Intended for both on-line and off-line applications, the 880E has a full-line 80 character buffer and a speed of 400 line/min at a print line width of 80 characters.

The Shepard Division of Vogue Instrument Corp. is at booth 1154.

Corpak 30 Expands 360/30

ATLANTIC CITY – Information Control Corp. plans to introduce its Corpak 30 add-on memory for 360/30 users.

The Corpak 30 provides the user with 32K or 64K bytes of additional memory for a total of up to 96K bytes.

The company will be in booths 1118 and 1120.

Syner-Data Readies 300 line/min Printer

ATLANTIC CITY – Syner-Data's Alpha line printer, designed for cost compatibility with minicomputers, is expected to be shown. Alpha is a fully buffered 300 line/min, 132-column impact type printer utilizing carbon-interleaved pin-fed paper.

Syner-Data's Beta terminal device, designed to meet increasing requirements for low-cost hard-copy terminal devices, will also be shown. Beta is a teleprinter communications terminal capable of operating speeds up to 30 char/sec and a business form line printer for systems not demanding extremely high speed.

Syner-Data products will be shown at booth 1453.

Syner-Data's Alpha Line Printer

Atlantic Technology Set To Show Display Terminal

ATLANTIC CITY – Atlantic Technology plans to show the ATC 2000 Local Multi Station Data Display Terminal in booth 1159.

The system is hardware and software compatible with the IBM 360 and 370. On-line connection can be made at either the multiplexer or selector channels of the computer. Up to 32 displays can be accommodated.

Price of a typical display station including controller is $140/mo. Purchase prices start just above $4,000. Delivery is 90 days.

Only TelTerm can recover the rolloffs.

If you've ever experienced top line rolloff, you'll really appreciate TelTerm's exclusive PAGING feature. It puts the rolloffs into memory, instead of into oblivion. And permits recovery at the push of a button. That means you have 3000 characters of display at your fingertips. In any format. Without going into a computer. And that means program preparation with less effort, in less time, and at less cost. Same goes for editing text, or entering inventory, reservations or business form data.

Of course, our other features match those offered by other video terminals, with one big difference: we've put the best of all into TelTerm. Like the most readable upper/lower case character set you can buy. And addressable cursor, blinking, underlining, formatting and line drawing capabilities. With more too. There's also a long list of useful accessories, such as a light pen, built-in acoustic coupler, hard copy printers, cassette recorders and multiplexers.

End the disappearing data act now. Ask for more information, demonstration, or applications assistance. Or ask about our Delta 1 color display. DELTA DATA SYSTEMS Corporation, Woodhaven Industrial Park, Cornwells Heights, Pa. 19020; telephone (215) 639-9400.

Delta Data Systems

See us at Booth 1139, SJCC

UNITS AVAILABLE ON 30-DAY DELIVERY

Atron Terminals IBM-Compatible

ATLANTIC CITY – Atron Corp. plans to show for the first time its set of IBM Model 20 remote job entry terminals.

Designed for 360-compatible communications with Hasp remote job entry, Atron Model 20 replacement terminals offer a reduction in the cost of intelligent, operator-oriented remote terminal processor systems.

The terminals are equipped with a keyboard/printer supervisory console. Peripherals for the Model 20 terminals range from 300- to 1,250-line/min printers and 300- to 1,000-card/min readers.

Atron's terminals will be in booths 1461, 1463 and 1465.

Atron Model 20 Terminals

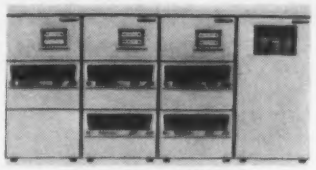
Calcomp to Show CD 1015/215

ATLANTIC CITY – California Computer Products, Inc. plans to introduce its Model CD 1015 Controller and CD 215 disk drive system.

The new system is plug-to-plug compatible with IBM 360 computers and requires no change in computer system software.

The CD 1015/215 system uses existing IBM 2316 or equivalent disk packs, but provides 400 information channels per disk surface instead of 200 information channels provided in IBM 2314/2319 systems.

Calcomp will be in booth 2411.



Calcomp 1015/215

Videojet Has Buffered Interface

ATLANTIC CITY – A.B. Dick Co. plans to introduce its recently developed "Buffered Interface" for the Videojet 9600 nonimpact printer. The Model 9613 asynchronous interface option is said to provide considerably more flexibility for the communications printer. Its prime advantage, according to the company, is printing speed – 250 char/sec vs. teletypewriter speeds of 10 to 15 char/sec.

The Videojet printer with buffered interface option will be available in May at a cost of $7,730. The interface operation will be shown in booth 1111.

A.B. Dick Model 9613

Conograph/10 Draws Using Conography

ATLANTIC CITY – The Conographic Corp. plans to demonstrate the Conograph/10, a graphic display terminal using a revolutionary new approach to producing curvi-linear drawings, general purpose graphics, alphanumerics and symbols. Conography, a new technique, uses conic sections to produce any curved contour regardless of its mathematical function.

Conographic Corp. is at booths 2443, 45.

AMP Shows Terminal

ATLANTIC CITY – The latest AMP data entry devices are being introduced here. The items include a job cost recording terminal, magnetic card readers, switches and scanners.

Also being shown are controlled impedance cable assemblies for use in high-speed, low-level circuits, miniature high-density connectors, and a line of edgemount connectors for leadless packaging.

The company will be at booth 1165.

Plotting System For CDC Terminal

ATLANTIC CITY – Houston Instrument plans to show the BTC-7/200 plotting system for the CDC 200 User Terminal. The device is said to be field installable, requiring no modification to the terminal or to the Export software used by a CDC 6000 computer for transmission to the terminal.

SJCC

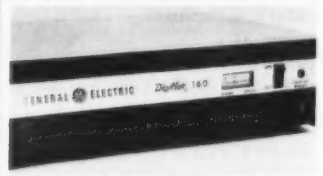
Housekeeping software available with the BTC-7/200 can be loaded from the terminal and permits plotting speeds up to 300 step/sec, according to the company.

Houston Instrument is at booth 1747.

Diginet Series Has Mixed Speeds

ATLANTIC CITY – The Diginet 160 series of private line multiplex systems, which permits an intermix of channel speeds, is expected to be displayed by GE.

Diginet 160 equipment moves data over lease or private four-wire voice-grade circuits in systems where permanent connections are needed between terminals and computer. The mixed speed capability allows users to have a wide variety of terminals within a network, GE said.



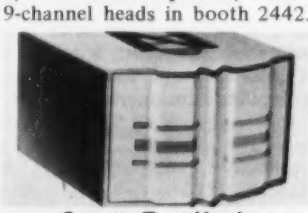
Diginet 160 Modem

The display is in booth 1526-B.

Recording Heads Ready

ATLANTIC CITY – An array of magnetic recording heads and accessories specifically designed for digital applications in computers and peripherals will be exhibited by Nortronics Co., Inc.

The company plans to introduce its new Ecma Proposed Standards read-after-write cassette head and will display its line of 1/4 in. and .150 in. minidigital heads, plus its line of 1/2 in. IBM-compatible, 7- and 9-channel heads in booth 2442.



Cassette Tape Head

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MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY
Advertisement for Bids

Sealed proposals will be received by the State Central Data Processing Authority, 508 Robert E. Lee Building, Jackson, Mississippi 39202, up until 2:00 p.m., Monday, May 24, 1971, for the following data processing equipment:

Request for Proposal No. 31 — Lease of a card reader, card punch, and eight (8) 9 channel tape drives with 800 and 1600 b.p.i. capability to attach to an existing RCA Spectra 70/45 computer system.

Request for Proposal No. 32 — Purchase of one (1) interpreting card punch and one (1) card verifier with 64 character keyboards, or two (2) combination cardpunch-verifiers. Used equipment will be considered.

Detailed proposal specifications may be obtained from the office of the State Central Data Processing Authority.

The State Central Data Processing Authority reserves the right to reject any and all bids and proposals and to waive informalities.

STATE AND CENTRAL DATA PROCESSING AUTHORITY
Charles L. Guest
Executive Director

Minis Share Equal Load in Jungle and Forest

BUENOS AIRES, Argentina – A computer is helping engineers build a highway in the middle of the Amazon jungle, while halfway around the world the same kind of electronic equipment is distributing timber profits to citizens of a remote Malaysian state.

A Burroughs L 2000 commercial minicomputer is accompanying the bulldozers and road graders of the Brazilian Army Engineering Corps' 8th "Rondon" Battalion to aid construction of a 527-mile segment of highway through the Amazon jungle.

The computer handles inventory for more than 15,000 items used by the project's survey, construction and transportation agencies. The items include vital engineering, maintenance and medical supplies.

The computer also processes the payrolls for the battalion's military and civilian personnel, involving the preparation of advance payments and benefits, tax and social security deductions, as well as completion of payslips and addressing of envelopes.

Applications

Construction of the Trans Amazon Highway is one of the most ambitious road building projects ever undertaken. When completed, the highway will extend some 800 miles from Santarem, in the north Brazilian state of Para, south to Cuiaba, in the west-central state of Mato Grosso.

Four Burroughs L 4000 minicomputers are aiding a project by which the government of Sabah, an East Malaysian state north of Borneo, is offering a share in the profits from its April timber harvest to all adult resident citizens.

Cash Dividends

The 3,000-square mile timber concession provided by the Sabah government is expected to be worth $5 million to $7 million, part of which will be passed on to the new shareholding citizens in the form of cash dividends, the rest to be used to fund new projects related to timber and other commercial fields.

Spreading across nearly 80% of its land area, timber is Sabah's major source of wealth. Total timber exports from Sabah in 1970 were worth well over $100 million.

Registration data on 275,000 residents participating in the program was collected after news of the program had been announced to Sabah's citizenry by village chiefs and district officers. The collected data was fed into the L 4000s in March, and by the end of May, the minicomputers will begin issuing the first trust certificates.

The computers are also being used in administering payroll, general accounting and timber billing. The last application includes complex weight and measurement calculations for which the computational power of the L 4000 systems is suited.

dicom industries
1st IN CASSETTE MAGNETIC TAPE SYSTEMS

Dicom's Cassette Mag Tape OPERATING SYSTEM (CMTOS) can pay for itself in 115 hours. Running a typical job using paper tape taking 4¼ hours, costs $64.00; the same job on CMTOS takes 6¾ minutes and costs only $0.92. Available for H-P, Nova, and PDP-8 computers.

715-C No. Pastoria, Sunnyvale, CA 94086
Tel: (408) 732-1060 SJCC Booth 2444

CalComp doesn't claim to be driving IBM right out of the business, of course.

But together with our disk drive subsidiary, Century Data, we're claiming a pretty fair share of the market. And a bigger share every month.

Last month, for example, we received orders for more than 300 disk drives.

And while over 90 percent of them will replace compatible IBM devices, we doubt if IBM will replace any of ours. For several reasons.

First, with average access times of 30 to 35 milliseconds, our disk drives are twice as fast as theirs.

Second, with electromagnetic positioning instead of mechanical pawls, detents and gears, ours are simply more reliable.

And third, ours cost less. Ten percent less on a year's lease than IBM's new, low-priced 2319 system, to be exact.

What's more, we've announced a new system of our own, called the CD 1015/215. In addition to being twice as fast as anything IBM delivers, it costs less and stores twice as much per spindle.

CalComp is the leading independent disk drive producer. The first independent to deliver a complete equivalent of IBM's 2314 system, in fact.

So naturally, we plan to produce a plug-to-plug replacement for their 3330 system when it becomes available. On next-generation 370 computers.

Meanwhile, we've got about 40,000 more disk drives on model 360 computers to shoot for.

Before we reach our peak.

CALCOMP

California Computer Products, Inc.
Dept. W-4, 2411 W. La Palma Avenue
Anaheim, California 92801

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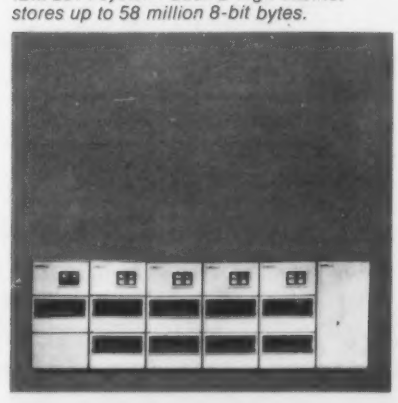
For complete information, addresses and phone numbers, please ask for Bulletin No. 130.

CalComp's CD 22/14 replacement for the IBM 2314 system. Each 2-high cabinet stores up to 58 million 8-bit bytes.



WE REPLACED THIS MANY IBM DISK DRIVES LAST MONTH.

A partial list of the distinguished "faculty members" who will help you solve your computer problems of safety, security and insurance . . . at the unique

COMPUTER PROTECTION/INSURANCE WORKSHOP

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Produced jointly by the publisher of BUSINESS INSURANCE newsmagazine and the publisher of COMPUTERWORLD newsweekly

Come to the Workshop for *ideas.*

Come to the Workshop for *peace of mind!*

For that's what it's all about—ideas to give you peace of mind that comes only from making certain that your computer operation is as risk-free as you can get it.

Top people in the computer safety/security/insurance fields will reveal their experiences and share their knowledge with you . . . you'll hear exciting panel discussions . . . you'll have plenty of opportunities to ask questions of the experts . . . and you'll benefit greatly from the give-and-take conversations you'll enjoy with other Workshop registrants from all parts of the country and in varied types of businesses.

The Workshop is a unique opportunity for you and other executives within your organization who are responsible for the total safety/security/insurance of your computer operation.

Pre-program announcements have also evoked a great deal of interest in the Workshop and advance registrations from insurance carriers, agents and brokers, and from safety/security suppliers to the computer industry, since the Workshop will give them a much deeper insight into the problems that face corporate management and how those problems are being solved.

Melvin Bockelman

Data processing manager, Kansas City Police Department, on computer operations and invasions of privacy.

Warren G. Brockmeier

Director-western region risk management department, Ebasco Services Inc., on risk management for computer centers.

Karl W. Fruecht

Corporate vice president, Household Finance Corp., on physical protection for computer installations.

Rolf H. Jensen

Chairman and professor, fire protection engineering department, Illinois Institute of Technology, on computer fire protection.

Gordon M. Paine

Assistant secretary, St. Paul Fire and Marine Insurance Co., on property insurance for computer facilities.

Louis Scoma, Jr.

President, Data Processing Security, Inc., on security for computer facilities.

Michael Verbick

Manager data processing, Playboy Clubs International, on security and protection for computer records.

Herbert T. Walworth

Manager, special technical services section, Kemper Insurance Cos., on protecting computer room employes.

Dr. Robert Wiper

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R. C. Bjorklund, T. J. Morton

Moderators. R.C. Bjorklund, editor *Business Insurance,* and T.J. Morton, Midwest bureau chief, Computerworld.

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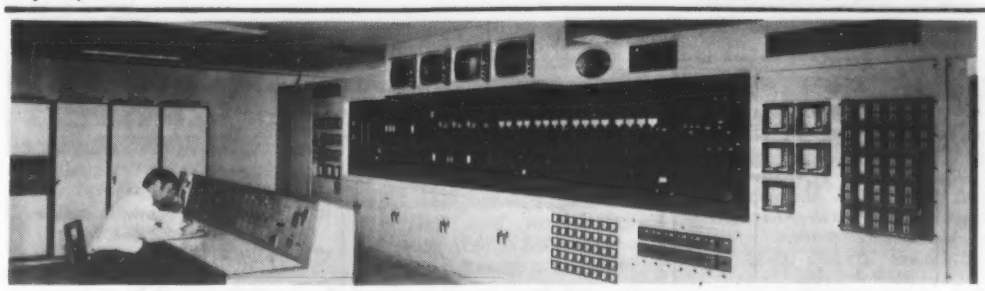

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Tons of gelatine, for table desserts, photographic emulsions and pharmaceutical tablets, are produced each day at Davis Gelatine's new extraction facility in Sydney, Australia. The entire process is monitored from this control room by a Digital Equipment Corp. PDP-8/L minicomputer located in the left background.

On-Line Order Entry System Allows New Zip in Emergency Parts Service

By W. Darrell White
Special to Computerworld

CAROL STREAM, Ill. – The Allis-Chalmers dealer who needs a replacement part for a customer in a hurry can now command the company's North American parts inventory resources with a single telephone call. The necessary part can be located in seconds, and its availability confirmed to the dealer on the telephone.

In minutes, a pick list and shipping documents can be printed at the appropriate stocking depot. Within one hour, the emergency order is filled and ready for shipment directly to the dealer regardless of shipping location.

Fast service like this has become a daily routine with Allis-Chalmers' "on-line" emergency parts order entry system. A telephone puts a dealer "on line" with a special operator at the nearest regional parts depot.

A CRT terminal puts the operator "on line" to the IBM 360/40 computer at Parts Central Division headquarters here. The computer monitors the current parts inventory balances throughout the network of regional service depots in the U.S. and Canada, and is "on line" to any depot to initiate shipment of required parts instantly.

One-Call Service

The system has made possible direct dealer-computer communications that expedite the emergency order process. The net result: fast, convenient one-call service for the dealer, and benefits that can be measured in days of costly equipment downtime savings for the dealer's customer.

The system is now fully operative at the "Parts Central" warehouse in Carol Stream, and at six regional parts depots.

The system's significant features include:

- Single source emergency order entry for each of 125,000 parts for equipment manufactured by Allis-Chalmers' powered equipment group – construction machinery, material handling, engine and industrial tractor.
- Instant inquiry that determines the on-shelf inventory status of a single part at a specified depot, total system-wide part availability, and also the in-transit part quantity en route to a regional depot.
- Immediate confirmation to the dealer of when and where the parts order will be shipped from and simultaneous update of inventory records to reflect up-to-the-minute parts availability at the individual depots and system-wide.
- Versatile dealer control over shipment destination and carrier. The dealer can specify his own, or a customer's shipping address, via surface, air carrier or parcel post. The order confirmation flashed on the depot operator's CRT terminal indicates the shipment's total weight and dollar value. Relayed to the dealer, this information helps him determine the most appropriate shipping method to fit the situation.

In addition to order processing speed and dealer convenience, Parts Central Division management wanted a system so versatile it could handle any emergency order situation. The system had to be simple, to assure a virtually foolproof computer terminal procedure, yet sophisticated, to detect and screen out inaccurate data.

Finally, it had to be fully compatible with the computer-based inventory management system, involving automatic replenishment of warehouse stocks, along with continual adjustment of inventories to reflect regional demand patterns.

All these goals have been met by the on-line terminal system.

A dealer can place an emergency parts order, receive confirmation of parts availability and record his precise instructions for shipment in as little as three minutes from the time he picks up the phone to call his regional service depot.

Within seconds after the dealer completes his call, the order pick list and the necessary shipping papers are printed at the regional depot which will ship the order.

In addition to the IBM 2260 visual display terminals at the depots for handling on-line order transactions, there are also IBM 1053 terminals to reproduce detailed order filling and shipping instructions from the computer.

One of the major bonus benefits of the on-line entry system is the capability it allows to rapidly adjust the standard parts inventory stock at a regional depot to meet the changing patterns of replacement part demand from dealers and customers served by that depot. In effect, the on-line order entry system constitutes a total depot operating system for emergency parts service.

W. Darrell White is manager, systems and data processing, for the Parts Central Division of Allis-Chalmers Manufacturing Co., Carol Stream, Ill.

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CI Notes

360 Raises Auction Price

GLENDALE, Calif. – A repossessed IBM 360/30 brought a higher price at auction here than a similar system did in New York City. Computer Applications, Inc., a bankrupt New York firm, had East and West Coast installations taken back by IBM. The one in New York brought $260,000 which was considered a record for the new field of computer auctions [CW, April 28].

However, at the Glendale auction, the winning bid was $282,000, going to Computer Microfilms Inc. New price for the system is $585,000. According to Mel Kleinman, Time Brokers, Inc., who appraised the computer for the auctioneers, IBM got a good price.

Auerbach Predicts Alphanumeric Display Growth Until 1975

PHILADELPHIA – Continued growth at approximately 40% per year is forecast for alphanumeric display devices by Auerbach Technology Evaluation Service. Despite this generally optimistic forecast, however, the study also shows that because of competitive factors the mortality rate will be high for the smaller companies in the field.

Auerbach said there are 84,000 units presently installed in the U.S., and this number is expected to increase several-fold by the end of 1975. The 10 largest A/N display manufacturers shipped more than 80% of the units sold during 1970, and their products represent 90% of the present installations. The Auerbach study predicts that the 10 largest companies will continue to dominate and only a few of the smaller companies will enjoy a share of the total market growth.

IRS Wants More for DP

WASHINGTON, D.C. – Secretary of the Treasury John B. Connally has asked a Senate appropriations unit for $19 million for DP equipment and for furnishing three new service centers for the Internal Revenue Service in fiscal year 1972.

Appearing before the Subcommittee on Treasury, Post Office and General Government, Connally said the total includes $8 million for special projects including automated systems for processing merchandise import entries.

Supershorts

The Electronic Systems Division of the Air Force Systems Command is seeking bids to replace DP equipment at the Air Force Academy, including a Burroughs B5500.

– – –

A study predicts that the number of computer installations in Ireland will triple by 1975. Prepared by a Trinity College, Dublin, professor, the report of the Economic and Social Research Institute pegs the current installed value at almost $20 million and foresees a 35% annual growth rate.

– – –

GE has established a data communication products department under Warren F. Kindt as general manager.

– – –

The Semiconductor Products Division of Motorola Inc., headquartered in Phoenix and the Societa Generale Semiconduttori (SGS), Paris have agreed to second source each other in certain families of integrated circuits.

Memory Survey Predicts

Ferrite Cores to Outdistance Semi Market

By E. Drake Lundell Jr.
CW Computer Industry Editor

NEW YORK – Firms betting on the continued dominance of core in the great memory sweepstakes can up their wagers, according to a survey of the "Digital Computer Memory Market" released recently by Frost and Sullivan here.

Even though the study projects a strong stretch drive by semiconductor memories, it predicts that ferrite cores will still outnumber semiconductors in bits by 1975 and that the core storage market will continue to increase in absolute value over the course of the period.

The core market, of course, has a much larger base, according to the study, accounting for $380 million out of a total memory market of $767 million in 1970. Semiconductor sales reached $44 million in 1970, while rotating memories accounted for $340 million in sales and other forms of memory registered sales of $3 million during the year.

The market for cores will reach almost $900 million by 1975, according to the projections, while the semiconductor market will show a greater growth curve and reach almost $480 million in that same year.

The rotating memory market will almost double in the same time span and be valued at $610 million in 1975. Other segments of the market will be valued at $25 million, in an overall market that will be worth just over $2 billion in 1975, Frost and Sullivan predicted.

During the same time span, the share of the memory market held by core systems will gradually decline, the figures show. Cores currently account for around 90% of the memory market, or 30 billion bits, but this share will drop to somewhere between 50% and 60% of the 1975 memory market.

Tape, Disk Explored

The sales of magnetic tape devices are estimated at $170 million in 1970 and are expected to grow to $240 million during 1975, Frost and Sullivan said. This would be a 70% increase, or an average growth rate of 14% per year. At the same time systems sales are projected at increasing at a rate of approximately 20% per year.

Sales of magnetic drums were estimated at $39 million in 1970 and will reach $68 million by 1975 for a 14% per year growth, also well below the projected growth rate for systems. The poor showing of drum sales, which will fall from 1.5% of systems to 1% of systems sales in the period, is attributed to inroads made by head-per-track disks and bulk core storage.

Disk sales, estimated at $131 million in 1970, will demonstrate a 90% growth to $252 million by 1975, for an average growth of 18% per year. In this category, head per track devices will grow from $12 million to $27 million for an average rate of 23% per year. Disk pack sales will jump from $119 million to $225 million during the five-year span, according to the report.

Optical, magnetic domain and ferroelectronic memories are new technologies on the horizon that stand the best chance for some penetration of the 1975 marketplace, according to Frost and Sullivan.

Computer Procurements Forecast For '71 Released by Army, Navy

WASHINGTON, D.C. – Two government agencies – the Army and Navy – have forecast future computer procurements in 1971.

The Navy's Automatic Data Processing Equipment Selection Office has issued a projection by calendar year quarters:

Second quarter 1971: Procurements to include replacement of a number of Univac Fastrand II drums with compatible storage devices at several locations of the Naval Supply Systems Command. Also, for the chief of naval personnel, replace an IBM 1130 with a small-scale computer having remote job entry capability to an IBM 360/65.

A third procurement will be replacement of an executable core memory with plug-to-plug compatible memory at selected activities.

Plug-to-plug compatible units will also be sought as replacements for 16 IBM 2420 series tape drives at various sites. There will be an option of an additional eight units.

The Naval Ship Systems Command will acquire 11 small computers for installation aboard naval vessels, and the chief of naval operations will acquire one optical character reader with options for 13 additional units.

The proposed Army procurements, issued by the Computer Systems Support and Evaluation Command here, cover RFPs that will be released through July which include:

AMC-OCR (T00A-70) – The Army will acquire optical character readers for seven subordinate commands of the Army Materiel Command. RFP release date is tentatively scheduled for May.

Basops (S00A-71) – The Army will acquire peripheral devices (magnetic tape units, disk drives and respective controllers) to replace existing IBM devices at 35 Army installations. Release date of RFP is scheduled for this month.

HQ Conarc-Coneds (S002A-71) – Benchmark specifications for an academic record system at HQ Conarc with 12 remote terminals at various Conarc schools. RFP release date: mid-July.

Pine Bluff Arsenal (T-412-70) – The Arsenal will acquire a source data collection system for labor and production control with one central recorder and 27 data collection terminals. RFP release date is this month.

SDR Source Data Reduction (B-00A-71) – The Army will acquire source data reduction equipment to be installed in finance and accounting offices worldwide. RFP release date is this month.

CSC-CSPM (A-150-70) – USACSSEC and the U.S. Army Computer Systems Command, Ft. Belvoir, Va., will acquire transportable hardware performance monitors.

Leasing Firm Backs Nixon Plan On Depreciation of Equipment

CW Washington Bureau

WASHINGTON, D.C. – A computer leasing company, Greyhound Leasing & Financial Corp., last week told the Internal Revenue Service at hearings held here that it supports President Nixon's proposal relating to depreciation allowances using the Asset Depreciation Range (ADR) system that would, in effect, encourage business to increase its investment in new machinery and equipment.

Mr. Nixon, who had originally proposed the allowances last January [CW, Jan. 20], would authorize the IRS "to accept depreciation based on lives for business equipment acquired after 1970 that are not more than 20% shorter nor 20% longer than the present 'guideline lives' fixed by Treasury in July 1962."

In comments filed with the IRS, GLFC, based in Chicago, said that benefits from these proposed measures "liberalizing and increasing the flexibility of depreciation deductions will inevitably be passed on to the lessees of GLFC, as well as the lessees of all other concerns in the leasing business, and thereby permit increased investment in capital goods, to the benefit of the economy."

Support also came from other quarters, including Sen. Charles H. Percy (R-Ill.) who explained that the revision was necessary for the U.S. to maintain its strength in foreign markets.

Those opposing the proposal include Ralph Nader, consumer groups, organized labor and most Democratic Presidential contenders. Among them, Sen. Birch Bayh (D-Ind.) said that the effect of the ADR system "is equivalent to a 4-6% reduction in corporate taxes." He said that "only Congress has the authority to alter tax laws, not the President."

Standards Bill Would Promote U.S. Exports

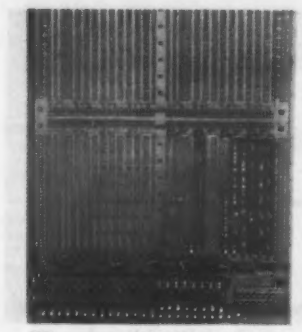
CW Washington Bureau

WASHINGTON, D.C. – The Department of Commerce has sent an administration bill to Congress designed to promote exports through strengthened international voluntary standardization and certification activities.

Called the International Voluntary Standards Cooperation Act of 1971, the bill would give the Secretary of Commerce principal federal responsibility for assuring that U.S. interests are adequately represented in international standardization activities.

The bill would also authorize the secretary to enter into grants or contracts with non-profit organizations to carry out such activities.

According to James H. Wakelin Jr., assistant secretary for science and technology, under the bill the U.S., by helping to write new internationally agreed upon standards, will make sure that they reflect U.S. engineering practices.



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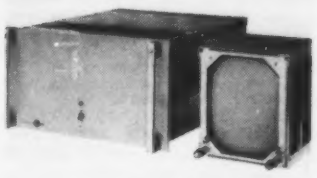

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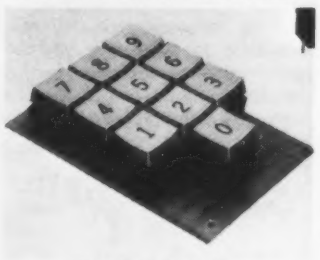

Elec-Trol Data Key

Semiconductor Memories Plans RAMs

PHOENIX, Ariz. – The RAM 300 series from Semiconductor Memories, Inc. (Semi) includes 11 memory system configurations, each on a single PC card, ranging from 2K to 9K bits. The new units have 300 nsec access times and 400 nsec cycle times. Inputs and outputs interface directly with TTL/DTL.

The memories operate from ±5V power supplies and are controlled by a single clock. Minimum input "1" voltage is 2V and maximum "0" voltage is 0.8 V. Typical power consumption is as low as 627 μW/bit. OEM prices in quantities of 100 average 4 cent/bit at the card level.

The Semi fabrication process results in two LSI memory arrays interconnected on an alumina substrate (0.63 in. by 0.63 in.) for a 256-bit memory module and identical sized support module containing all associated support functions on a single LSI chip.

The RAM 300 series includes a variety of standard word configurations and word lengths ranging from the RAM 328A (256 words by 8 bits) to the RAM 389B (1K by 9).

The chip joining process, also known as the controlled collapse reflow solder system, is based on the IBM-developed Solid Logic Technology (SLT). Each chip is joined to the substrate pin interconnections in a single pass through a reflow furnace.

Microdata I/O Wire-Wrap Tray Aids Interface Designs for Micro 400

SANTA ANA, Calif. – An input/output wire-wrap tray from Microdata Corp. aids in the development of special interface designs for the Micro 400 minicomputer. The tray accommodates up to 232 14-pin I/C sockets, 48 16-pin I/C sockets and 16 24-pin I/C sockets in any combination.

Special designs are wire wrapped on the socket pins. Also included are facilities for the installation of various combinations of discrete components. I/O bus drivers and receivers are included on the board. Six 50-conductor PC connectors provide ample capacity for interface design.

Cost for the tray without sockets is $200. Each 14- and 16-pin socket costs $1.50, each 24-pin socket $3.50, according to Microdata at 644 E. Young St., 92705.

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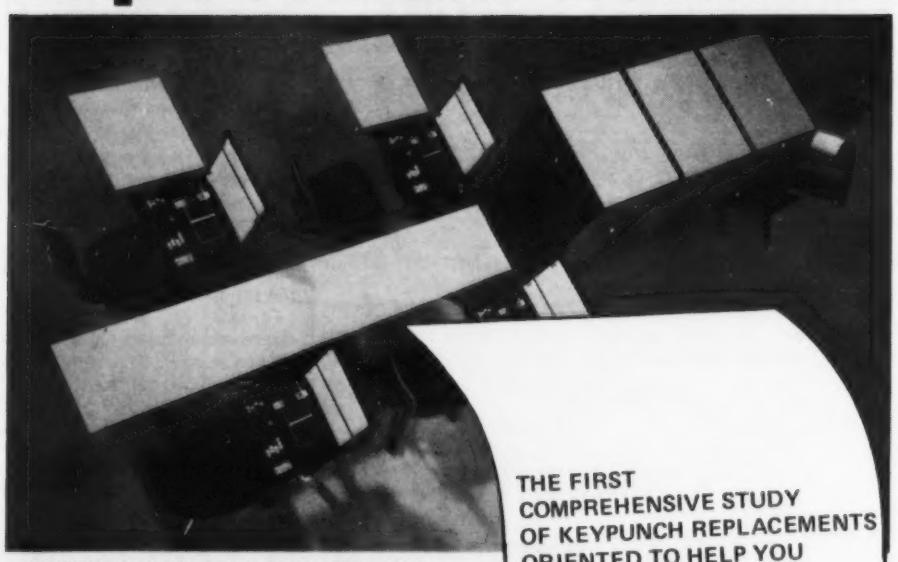

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New OEM Products

Decision Has 96-Column Reader

WARMINSTER, Pa. – A 300-card/min table-top reader from Decision Data Corp., the 9625, is designed to read the 96-column card.

The 9625-01 includes all read sensing and basic electronics, read checking, 96-column buffer, motor controls, transport and 600 card capacity input and output stackers. The 9625-02 includes read sensing circuits, transport, input and output stackers, and casework. List price for the 9625-01 is $1,200; $800 for the 9625-02, with OEM quantity discounts available from 300 Jacksonville Road, 18974.

Kratos Unveils CRT Monitor

CANOGA PARK, Calif. – Kratos Display Division's high-speed random position display has a writing rate of .75 μsec/in. Jump scan time of 6 μsec and spot size less than 0.010 in. are included in the Model RM 310.

The display indicator provides a capability of interchanging tube sizes from 5 in. to 24 in. The Model RM 310, available as either a remote indicator or single package, uses Dynamic Focus for spot size control and improved brightness. The firm is at 7825 Deering Ave., 91304.

Elec-Trol Has Low-Profile Data Key

SAUGUS, Calif. – Low profile data keys developed by Elec-Trol, Inc. are available in 10, 12, and 16 key arrays, as well as custom arrays to exact requirements.

The key incorporates a hermetically sealed reed switch, operated by a moving permanent magnet. The firm is at 26477 N. Golden Valley Road, 91350.

Mostek Heralds 256-bit RAM

CARROLLTON, Tex. – Mostek Corp.'s new 256 by 1-bit random access memory, the MK 4007 P, is a pin-for-pin replacement for the Intel 1101/11011. Chief feature of the 4007 is its low power requirement of 250 mW.

In quantities of 100, the units sell for $14 from 1400 Upfield Drive, 75006.

Phonocopy Reveals PH400 Modems

STAMFORD, Conn. – Phonocopy, Inc.'s PH4000 series of digital and analog data modems includes the 4000 A (analog version), the PH4000SD (synch digital), the PH 4000 ND (non-synch digital).

The PH4000AE (automatically equalized) and the PH 4800 AE (4,800 bit, automatically equalized) will also be included. The modems are designed for the high speed, low cost modem market and are compatible with Western Electric Series 500 hand sets, DAA hard wire for DDD lines or hard wire to leased lines, according to the firm at 120 Long Ridge Road, 06904.

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Clover Stores just opened in February. And already they've eliminated the biggest problems in mass merchandising.

You don't have to be a genius to know what fouls up a retail operation these days:

The mixup with price changes.

And stock outs.

Even things like the long wait at the cash register while a clerk tries to figure out the sales tax from a piece of paper pasted on the register.

Before Clover Stores, Division of Strawbridge & Clothier, opened on February 25, management figured there must be a better way to run a business.

And there is.

The Friden* Modular Data Transaction System (MDTS), the computerized cash register system, and Singer Information Services Company (Sisco) retail application software are in and working for retailers right now.

Clover has 29 MDTS units working in its new store. Each of these cash registers is a terminal to the System Ten Computer. This is the first of 10 stores that Clover will open in the next 5 years. It's one of the first chains built and organized around the computer.

And it's going to make retailing a whole new ball game.

Hardware and know-how

80% of everything you need to know about your business comes through your cash register.

The MDTS captures all that data at its source —while the clerk is ringing up the sale.

There's nothing more for her to do.

And, incredibly, there's nothing more for you to do. Because of Sisco, the people who provide full information services to the retail industry.

Complete Retail Information Services

At the end of each day's business Sisco polls the Friden System Ten Line Concentrator at the Clover store in Cherry Hill, New Jersey, and transmits the data over voice grade telephone lines to Sisco's third generation, large frame computer at Wayne, New Jersey.

During the night Sisco processes the transactions using their proprietary Sales Audit and Unit Control System and transmits a 'Flash Sales Report' to the Clover headquarters in Philadelphia, Pennsylvania by 8:30 the next morning.

The print-outs provide a complete recap of the previous day's sales by department and classification, cash overage and shortages, audit trail of data transmitted and an edit listing by employee for every register denoting any errors that occurred.

Once the flash data has been audited, corrections are then transmitted to Sisco's computer at Wayne where the necessary file changes are made and the Audited Sales and Merchandising Reports are transmitted back to Clover headquarters in Philadelphia.

In addition to the traditional sales reports, Sisco's System details unit sales by Vendor, Style, Color, Size, Silhouette and Fabric. This information is also summarized by Classification and Price Line, thus providing up to the minute unit sales information. Clover officials claim that the System will help identify and replenish fast moving items.

This total retail information system has the unique characteristic of being virtually automatic. Between the time the sales person presses the 'total' button on the data terminal, and the reports are printed out at Clover headquarters, store personnel are not involved.

You're next.

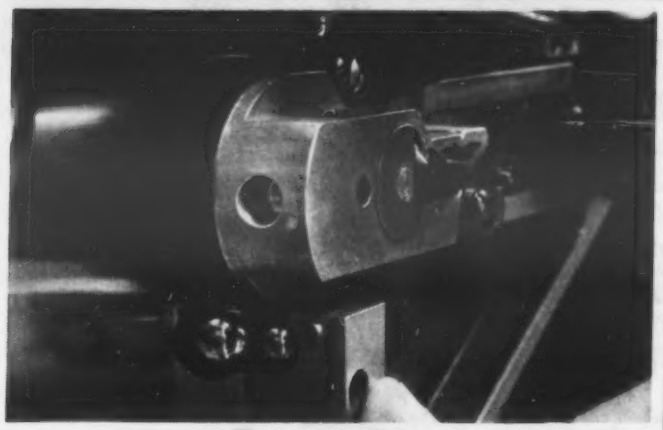
What Friden and Sisco did for Clover Stores, they can do for you.

Because this is the retail computer system that's in and working, all around the country.

It's not on the drawing boards. It's not "coming soon." It's not a promise. It's a fact.

For complete information on the proven, tested retail information system, write Friden Division, The Singer Company, San Leandro, California 94577 or Sisco, 30 Rockefeller Plaza, New York, N.Y. 10020.

Friden-Sisco full service retail information systems from SINGER



Topspin

IBM development technicians borrowed the physical principle of the toy top for an experimental tool to align tape drive capstans – the slotted wheel beneath the top. The alignment block contains two steel ball bearings. When the larger one, at left, is placed in contact with the rotating capstan, it begins to spin like a top where its surface touches the smaller bearing. If the capstan is out of alignment, the friction point between the bearings is shifted off center and the small one rotates.

Rickover Charges

DP Firms Withhold Cost, Pricing Data

CW Washington Bureau

WASHINGTON, D.C. – Vice Admiral H.G. Rickover told the Joint Economic Committee of the Congress recently that computer companies are among those defense contractors who "regularly refuse to provide the cost and pricing data required by the Truth-in-Negotiations Act."

He recommended that contractors who refuse to comply "should be ineligible for contract awards just as they are when they do not comply with other federal laws such as the . . . Equal Employment Opportunity Act."

Rickover stated that the Atomic Energy Commission and the General Services Administration "report that the computer industry as a whole refuses to provide the cost and pricing data required by the law, even though the government buys about $3 billion worth of computer equipment each year."

Testifying on problems in defense procurement, Rickover, the father of the Polaris Submarine and a well-known critic of the Department of Defense despite his position in the military, said that the U.S. is weakened by a procurement system that overall "rewards inefficiency.

"Wasteful subcontracting practices, inadequate cost controls, shop loafing and production errors mean little to . . . contractors since they will make their money whether their product is good or bad, whether the price is fair or higher than it should be, whether delivery is on time or late," he charged.

Citing profits, Rickover said that defense contractors "do not have to account to the Department of Defense, to Congress or the public for costs and profits on defense contracts."

"We spend $35 billion or more every year without knowing how much of it goes for profit," he said.

Rickover also hit out at contractors who "get and keep government-owned tools to perform government and commercial work," expanding their capacity and profit base "without increasing their capital outlay."

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Minicomputer Study Sees Market Potential At Over 500,000 Units

PHILADELPHIA – The potential domestic market for minicomputers is well in excess of 500,000 units, according to a new study by the Auerbach Technology Evaluation Service. The study points out that with an installed base of only 21,500 machines at the end of 1970, enormous opportunities exist for future growth in the industry.

While great opportunities exist, factors such as price declines of 18% per year, fierce competition and changing technology will place demanding requirements on the participants in the minicomputer market. The study predicts that industrial control applications will continue to be the largest area of growth and peripheral devices, which now account for 60% of the total minicomputer system cost, will grow in importance in minicomputer systems.

Line Printer Paper Carbonless, Gummed

ST. PAUL, Minn. – The 3M Co.'s Paper Products Division is offering forms manufacturers two recently improved papers for use with line printers, Carbonless Paper Type 100 and Prone gummed label paper.

The self-contained carbonless paper, with image chemistry integral to each ply, requires no coating contact to form an image and may be used, the company said, with special originals such as safety paper, Micr and OCR bonds. The resultant blue-purple image can be copied electrostatically.

The Prone gummed paper has a dry-type adhesive that resists curl caused by moisture and variations in temperature and humidity.

Type 100 is priced at about 5% lower than a comparable coated carbonless paper multicopy set. Prone is competitive in price with other gummed papers, 3M said.

Forms Requirements Eased

WHITE PLAINS, N.Y. – Manufacturers of forms intended to be used with IBM 1287 and 1288 OCR units were recently informed by IBM that the company had relaxed its requirements for paper smoothness, porosity and cleanliness.

The new requirements, IBM said, brought the company into line with the rest of the industry, simplifying the task of users ordering forms. IBM also informed manufacturers of altered requirements in background ink that were brought about by changes made in the readers.

Reel-to-Reel Tape Drives Meet User's Needs — Wang

By Dr. Ben C. Wang
Special to Computerworld

The industry-wide rush to lower cost equipment, while it has created its problems, has in general provided the impetus for some really innovative effort – and sometimes it comes in areas where it is least expected. Nowhere is this more true than in off-line mass media storage.

The answer to low-cost tape storage has always been paper tape. The only problem was that nobody really liked it. The medium itself was unreliable and inflexible enough, but the real problem was the paper tape readers and punches. Noisy and terribly slow, this tape handling equipment was and is continually breaking down.

DP managers, irked by expensive downtime, knew that paper tape was quite costly in the long run and began to cast about for a reasonable alternative.

One of the most promising candidates was the cassette applied to digital recording. It seemed to have all the essential elements – it was quieter and faster, it could be reused, and it was cheap. After all, the cassette revolutionized the audio tape industry; why not the digital tape industry?

For quite a few reasons, as it turned out. To date, the cassette simply does not offer sufficient data reliability for most DP applications. Part of the problem is the half-mil Mylar tape which made it extremely difficult to track with the precision necessary. Then, there is the equally severe problem of a lack of control guide mechanisms which results in tape skewing. Further, the low speed (10 to 15 in./sec) and low capacity (300 feet) make cassettes awkward to use for a large number of DP applications.

Designers have been wrestling with these problems for some time and have yet to come up with an answer that would give the required reliability, repeatability and flexibility. In fact, the industry has been unable to standardize either on a cassette or a format – and there is no early solution in sight.

In an effort to overcome the problems of the medium, tape drive manufacturers have devised ingenious mechanisms to partially compensate for the performance degradation inherent to the cassettes. Dual capstans and dual reel motors, for example, are used to permit relatively fast start and stop times.

With each compensating mechanism added, however, the cost of this tape handling equipment goes up. Currently, models which will permit the use of cassettes are up to $1,000, and many of the cassette problems still remain.

This came as a sharp disappointment to the hopeful DP manager, particularly since he knew he'd have to pay another $1,000 for a pooler to perform the serial to parallel conversion necessary to generate IBM-compatible tape that he could use in his overall system. This, coupled with the industry confusion over standardization, has made most DP users reject or at least defer for a few years the use of cassette recording equipment in their facilities. The innovation intrigues them but not at such a cost to their overall operations.

Reel-to-Reel

Almost unnoticed was another development, not so dramatic as the cassette concept, but much more cost/effective. Manufacturers had taken a hard look at reel-to-reel, IBM-compatible tape drives and had their designers develop new models which could be priced low enough for the market.

The job required more innovative engineering than it sounds. As recently as last fall, a national magazine solemnly pronounced that "IBM-compatible transports have certain built-in factors which make reasonable performance at quantity prices under $2,000 per unit difficult to achieve . . . alternate solutions offer the only possibility of significantly reducing transport costs."

Pronouncements such as this are always dangerous, but seldom has one been proved so wrong so quickly. Already several reel-to-reel, IBM-compatible tape handling systems under $2,000 are on the market, and one of these is under $1,500. At these prices, DP managers could afford the performance and flexibility of reel-to-reel, IBM-compatible tape systems for all their applications.

From a performance standpoint, of course, high-grade, IBM-compatible tape on a good tape handling system is by far the best tape medium. It permits speeds, capacities and data reliability that simply are not possible with other approaches. The tape handling systems were equally good.

Some models, for example, have such features as a tri-level read threshold for recovering marginal data, variable electronic deskewing to ensure bit alignment during the write operation, and the use of IBM head guide spacing for optimum interchange with IBM tape systems.

With the new price structure, DP managers stopped waiting for future developments and started buying. It's not just the low acquisition price. That's just the door which lets the customer standardize on IBM-compatible tape and gain its performance and flexibility. They work only with repeatable, 9-track parallel tape throughout their DP system. They don't need a pooler, so right there they save $1,000 and preclude a possible loss of data in the pooling operation.

Define Features

The key was to define the features that a user really needed, eliminate the frills, and then develop innovative mechanization of the necessary features. In this manner, the cost of the drives was brought down without tampering with the tape medium itself.

Such developments are not so romantic as inventing an entirely new medium, but they are no less innovative. Perhaps in the future, the technology of tape cassettes will develop to the point where this medium can offer the flexibility and reliability needed. A number of manufacturers are working in this area, and with that enormous market as an incentive, it shouldn't be too many years away.

Dr. Ben C. Wang is president of Wang Computer Products, Inc. He began his career in the computer tape field at IBM, and then directed tape memory development at Ampex. Subsequently, Dr. Wang initiated XDS's in-house development of peripheral equipment, which resulted in a line of digital tape transports.

Former VIPers Found Firm

WASHINGTON, D.C. – A group of former VIP Systems Corp. employees has formed a new company here called Business Information Systems Inc. VIP, a text editing house, went out of business in March [CW, March 31].

BIS, according to its founders, will develop advanced ATS/360 features for the Beloit (Wis.) computer center and will serve as the Washington marketing and support office of the Beloit Corp. BIS is also performing systems programming for other customers in the area of teleprocessing and commercial applications.

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Graham 9-Month Earnings Increase 435%

NEW YORK – Just like in the old days, there's a computer company reporting a 435% increase in earnings. This time, though, it's 1971, and the company, Graham Magnetics, has racked up earnings of $1.02 a share, including a non-recurring gain of 14 cents a share, for the nine months ended March 31.

Net earnings of $687,102 for three-quarters of the current fiscal year compare with $128,438, or 19 cents per share, for the same period last year.

The earnings increase resulted from sales of $5.7 million, a 59% increase over 1970 sales of $3.6 million for the comparable nine-month period.

The nine month figures are even better than the half year results. In the six months net increased 251% and sales 65% to $477,642 and $3.9 million respectively.

Development of a new magnetic particle called "Cobaloy" that is said to increase by more than four times the amount of information that can be placed per inch on audio and video tapes was announced recently. The new particle is also expected to have impact in the digital tape market as it allows an increase in bit density from 1,600 bit/in to 20,000 bit/in. Plans for manufacturing and possible licensing of others to make the new particle are now underway, Graham said.

Graham Magnetics now ranks fourth in sales among computer tape manufacturers in the U.S. with approximately 15% of the industry total, according to the company.

Financial

Applied Data Trims First Quarter Loss

PRINCETON, N.J. – Helped by a change in amortization procedures, Applied Data Research, Inc. (ADR) reported operating revenues for the first quarter ended March 31 of $1.6 million and a net loss of $145,206 or 15 cents a share.

This compares with operating revenues of $1.4 million and a net loss of $306,007 or 32 cents a share for the similar reporting period in 1970.

On Jan. 1, 1971 ADR altered its accounting policy, extending the period of amortization of deferred development costs from three to five years.

ADR said it believes this change results in a more accurate reflection of the useful life of its proprietary products, and provides a more realistic relationship between costs and revenues. The effect of the change is to reduce the net loss for the first quarter of 1971 by $71,000 or 7 cents a share.

"We have completed a characteristically slow first quarter in a sluggish economy. We are currently experiencing a noticeable upturn in sales and expect the year to be profitable," commented ADR's president.

Sycor Halves Quarter Loss

ANN ARBOR, Mich. – Terminal making Sycor, Inc. has halved its first quarter loss, from 1970's $1.1 million to $544,000, and tripled revenues for this period from $568,000 to $1.7 million.

In the last quarter of 1970, Sycor lost $640,000.

President Samuel N. Irwin said Sycor is "pleased with the progress being achieved in the U.S. market."

Computer Technology Notes Profit For 3 Months as Revenues Decline

DALLAS – University Computing's facilities management subsidiary, Computer Technology Inc., (CT) reported a profitable first quarter of 1971 compared with a loss in the like period of 1970.

In 1971's first three months, CT had consolidated net income of $437,000, including an extraordinary item of $84,000. This compared with a loss of $667,000 for the comparable period last year. Revenue declined to $9.1 million from $9.7 million.

Net income per CT common share in the 1971 period was equal to 8 cents compared with a loss of 12 cents in 1970.

Revenue obtained from clients other than the Ling-Temco-Vought, Inc. group of companies for the period was $1,874,000 (21%) compared with $1,142,000 (12%) in the first quarter of 1970.

CT is UCC's Dallas-based EDP facilities management organization offering computer services to users in business and government.

UCC owns 71% and public holders have 29% of the outstanding CT common stock.

Acquisitions

Computer Services Corp. has agreed to acquire **Computer Control Corp.** for stock and cash Both companies are based in Southfield, Mich. Computer Control specializes in municipal and hospital data processing.

The transaction will involve 30,000 shares of Computer Services stock and $50,000.

Record Retention and Retrieval Corp. (3R), Valley Stream, Long Island, has agreed to purchase **Opticomp Data Management Corp.**, Manhattan, N.Y., for an exchange of 3R common stock. Both firms are microfilm service bureaus.

Tracor Computing Corp. (TCC) has agreed to acquire, for stock, two wholly owned subsidiaries of Bresnahan Computer Corp., **Bresnahan Data Center, Inc.** and **Applied Data Sciences, Inc.**, both of Chicago.

Under the terms of the agreement, TCC will combine its Chicago data center operations with those of the two acquired companies, operating them as a wholly owned subsidiary under the name of Bresnahan Data Center, Inc.

Data Science Corp., San Diego, Calif., has been acquired by **The Susquehanna Corp.**, Alexandria, Va. Data Science will operate as a subsidiary reporting to Susquehanna's Atlantic Research Division. Data Science manufactures products for the aerospace industry and peripherals.

Computing and Software, Inc. (C&S) has purchased **W.R. Simmons & Associates Research, Inc.** for an undisclosed amount of cash and notes from National Student Marketing Corp. Simmons offers data-base oriented marketing services.

Time-Sharing Terminals, Inc. has acquired the **Computer Terminal Division** of Gulton Industries.

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Earnings Reports

NATIONAL CASH REGISTER
Three Months Ended March 31

	1971	a1970
bShr Ernd	$.25	c$.39
Revenue	343,600,000	308,050,000
Earnings	5,532,000	8,576,000

a-Restated for acquisition on a pooling-of-interests basis. b-On a fully diluted basis. c-Adjusted for two-for-one stock split in May 1970.

CONTROL DATA
Three Months Ended March 31

	f1971	a1970
bShr Ernd	$.80	.....
Revenue	141,007,000	$125,539,000
Inco Par Co. (Loss)	705,000	(6,664,000)
Comm Cred	12,255,000	8,312,000
eLoss Affil	1,027,000	1,221,000
Spec Cred	711,000	30,000
Earnings	c12,644,000	457,000

a-Restated to include the company's equity in the net loss of approximately 50% owned affiliates. b-Based on income before special credit. c-Equal to 85 cents a share. e-Approximately 50% owned affiliates. f-As of Jan. 1, 1971, the company extended the estimated useful lives for calculating depreciation of its computer systems and related equipment from four years to five and six years. This change had the effect of increasing net earnings for the quarter by $2,200,000, or 15 cents a share.

COMPUTER TECHNOLOGY
Three Months Ended March 28

	1971	1970
Shr Ernd	a$.06	.....
Revenue	9,103,000	$9,687,000
Earnings (Loss)	b437,000	(667,000)

a-Based on income before tax credit. b-Equal to eight cents a share.

SYSTEMS ENGINEERING LABS
Three Months Ended March 26

	1971	1970
Shr Ernd	.....	$.23
Revenue	$2,979,882	5,649,005
Earnings (Loss)	(1,165,108)	532,693

a-After giving effect to writeoffs of $1,214,245 for certain obsolescent inventory items and other assets.

AUTOMATIC DATA PROCESSING
Nine Months Ended March 31

	1971	a1970
Shr Ernd	$.56	$.40
Revenue	35,112,409	27,654,938
Earnings	3,054,432	2,003,112

a-Reinstated for acquisitions on a pooling-of-interests basis.

BALTIMORE BUSINESS FORMS
Three Months Ended March 31

	1971	1970
aShr Ernd	$.10	$.21
Revenue	4,292,642	4,470,007
Earnings	80,075	156,543

a-On a fully diluted basis.

UARCO
Three Months Ended March 31

	a1971	1970
Shr Ernd	$.48	$.65
Revenue	26,454,600	24,015,100
Earnings	974,500	1,336,300
6 Mo Shr	.89	1.30
Revenue	53,029,800	47,635,800
Earnings	1,815,700	2,665,900

a-Includes Drummond Business Forms Ltd. Canada, acquired in April 1970.

DIGITAL EQUIPMENT
Three Months Ended March 27

	1971	1970
Shr Ernd	$.23	$.43
Revenue	35,813,000	36,123,000
Earnings	2,342,000	4,077,000
9 Mo Shr	.78	1.10
Revenue	104,330,000	97,000,000
Earnings	7,748,000	10,364,000

TRACOR COMPUTING
Three Months Ended March 31

	1971	a1970
Revenue	$1,975,000	$2,386,000
Spec Cred	.....	b71,000
Earnings (Loss)	22,000	(219,000)

a-Restated to include acquisitions on a pooling-of-interest basis. b-From sale of Products Division to Tracor Inc.

ELECTRONIC ASSOCIATES
Three Months Ended April 2

	1971	a1970
Shr Ernd	b$.01	.....
Revenue	5,526,000	$6,078,000
Spec Cred	c133,000	.....
Earnings (Loss)	e164,000	(1,067,000)

a-Restated to reflect an accounting change. b-Based on income before special credit. c-Gain on sale of land and building. e-Equal to six cents a share.

Nickels and Dimes

MAI shareholders have approved a plan to double the number of authorized common shares and create a new class of $1 preferred. The recapitalization is part of a project to retire convertible debentures and shore up the financials of the long-ailing company.

$$$

From the **Inforex** annual meeting: So far the company has installed "some 250" key entry systems, and production rate is averaging 50 a month.

$$$

From the **IBM** annual meeting: Prodded by an abrasive shareholder, Thomas Watson revealed that the Colossus is contemplating adding a woman to the board of directors. One name that came out was Mrs. Patricia Roberts Harris, a black and a former ambassador to Luxembourg.

$$$

The board of **American Business Products** has approved a 3 for 2 split of ABP's common, to be carried out through a 50% stock distribution. The dividend rate will be 16 cents a year, 50% above the 1970 rate, beginning in September.

$$$

Ross Perot's capital commitment to Wall Street broker **duPont-Glore Forgan** has gone up from $30 million to $40 million. The New York exchange's Board of Governors has also agreed to indemnify Perot's group against another $15 million if duPont's losses go over $40 million. Morton Meyerson, who will become head of the brokerage house if the deal goes through, said that the Texas interests will soon have invested $20 million in duPont.

$$$

And while we're on duPonts, Henry of that clan, the head of **Sci-Tek** has acquired American Computer Service from Cincinnati's American Computer Leasing. The new acquisition provides computer services involving numerical control, and will be renamed NCD, Inc. In March Sci-Tek took control of the former Univac metropolitan New York service bureau in Mineola, L.I.

$$$

More automation at the Amex as plans go forward for a test early in 1972 of a computerized odd-lot trading system. An incoming odd lot order (under 100 shares) would be identified by the exchanges' computer and filed in memory. As soon as a round lot order was executed in the issue, the odd lot order would be retrieved, executed by the computer, confirmed with the originating broker, and reported to the specialist in the stock. The system would handle only market orders, those calling for purchase or sale as soon as possible at the market price.

TRADE*QUOTES

Computerworld Stock Trading Summary

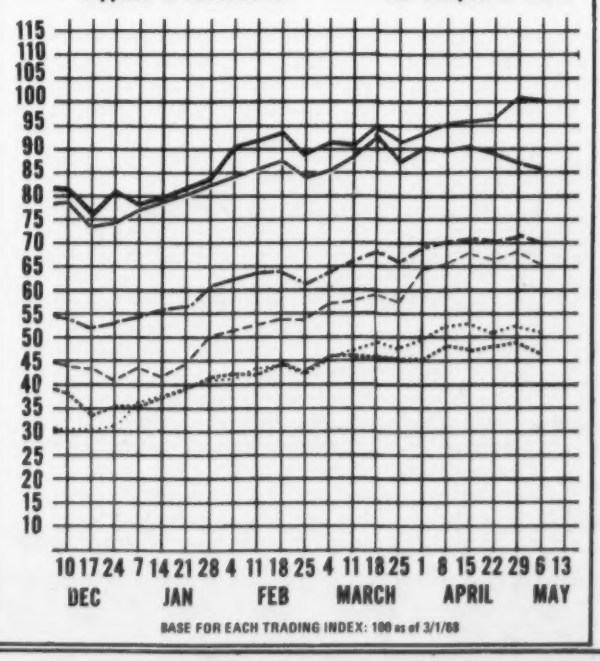
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, MAY 6, 1971

EXCH		1971 RANGE (1)	CLOSE MAY 6	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	2- 4	1 5/8	- 3/8	-18.7
A	APPLIED DATA RES.	5- 13	8 7/8	- 3/4	-7.7
O	APPLIED LOGIC	1- 3	1 1/2	0	0.0
O	ARIES	1- 2	1 1/4	- 1/8	-9.0
N	AUTOMATIC DATA PROC	44- 60	59	0	0.0
O	AUTO SCIENCES	5- 8	6 3/8	0	0.0
O	BOOTHE DATA SYS	1- 2	1 3/8	0	0.0
O	BRANDON APPLIED SYS	1- 1	7/8	0	0.0
O	COMPUTER AGE INDUS.	1- 2	5/8	0	0.0
O	COMPUTER ENVIRON	1- 2	1 1/8	- 1/8	-10.0
O	COMPUTER INDUS.	4- 5	5	0	0.0
O	COMPUTER NETWORK	3- 10	9	+ 1/4	+2.8
O	COMPUTER PROPERTY	6- 11	9 1/4	-1 1/4	-11.9
N	COMPUTER SCIENCES	9- 17	15	- 7/8	-5.5
O	COMPUTER TASK GROUP	1- 2	1 1/2	0	0.0
O	COMPUTER USAGE	5- 16	9 5/8	- 7/8	-8.3
O	COMP AUTOMOT REPORTS	6- 13	11 7/8	- 3/8	-3.0
A	COMPUTING & SOFTWARE	27- 45	38	-4 1/8	-9.7
O	COMRESS	2- 4	3 5/8	+ 3/8	+11.5
O	COMSHARE	4- 8	6 5/8	- 5/8	-8.6
O	CONSOL. ANAL. CENT.	1- 2	1 3/4	+ 1/8	+7.6
O	DATA AUTOMATION	1- 4	2 1/2	- 1/8	-4.7
O	DATA PACKAGING	7- 10	8 3/8	0	0.0
O	DATAMATION SERVICE	1- 3	1 1/4	0	0.0
L	DATATAB	4- 10	9 3/4	+ 1/4	+2.6
O	DIGITEK	1- 3	2 3/4	- 1/4	-8.3
O	EDP RESOURCES	7- 16	14 1/2	-1 3/4	-10.7
A	ELECT COMP PROG	3- 7	4 5/8	- 1/2	-9.7
N	ELECTRONIC DATA SYS.	61- 85	66	-4 1/8	-5.8
O	INFORMATICS	7- 15	14 1/2	+ 3/4	+5.4
A	ITEL	15- 23	19 1/4	0	0.0
O	KEYDATA CORP	10- 14	11 1/4	- 5/8	-5.2
A	MANAGEMENT DATA	8- 11	9 7/8	+ 3/8	+3.9
O	NATIONAL CSS INC	7- 14	12 1/4	-1 1/4	-9.2
O	NAT COMP ANALYSTS	1- 4	3	- 1/8	-4.0
O	NAT.COMP. SERV.	2- 3	2	0	0.0
N	PLANNING RESEARCH	16- 26	21 1/8	-1 7/8	-8.1
O	PROGRAMMING METHODS	18- 29	23 1/2	-1	-4.0
O	PROGRAMMING & SYS	2- 4	2 3/4	+ 1/8	+4.7
L	PROGRAMMING SCIENCES	1- 3	1/2	- 1/8	-20.0
O	SCIENTIFIC RESOURCES	1- 2	7/8	0	0.0
O	SOFTWARE SYSTEMS	1- 2	1 3/8	0	0.0
O	TBS COMPUTER CENTERS	5- 9	5 5/8	- 7/8	-13.4
O	TOLLEY INTL CORP	3- 8	6 7/8	- 5/8	-8.3
O	UNITED DATA CENTER	2- 6	4 3/4	0	0.0
N	UNIVERSITY COMPUTING	21- 33	31 1/4	+1 7/8	+6.3
A	URS SYSTEMS	7- 11	7 5/8	- 1/4	-3.1
O	U.S. TIME SHARING	1- 3	2 1/4	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	24- 42	41 1/2	+4 1/4	+11.4
O	ALPHANUMERIC	3- 6	3 3/4	- 1/2	-11.7
N	AMPEX CORP	17- 25	19 3/4	-1 5/8	-7.6
O	ASTRODATA	1- 2	1 3/4	0	0.0
O	ATLANTIC TECHNOLOGY	3- 8	7 3/4	+1 7/8	+31.9
A	BOLT,BERANEK & NEW	6- 8	7 1/4	- 1/2	-6.4
N	BUNKER-RAMO	10- 17	15 5/8	+ 1/8	+0.8
A	CALCOMP	23- 33	29	-1 1/2	-4.9
O	COGNITRONICS	6- 9	5 3/4	- 3/8	-6.1
O	COLORADO INSTRUMENTS	4- 8	4 3/8	-1 5/8	-27.0
O	COMPUTER COMMUN.	6- 19	12 3/4	-1 3/4	-12.0
A	COMPUTER EQUIPMENT	4- 7	6 7/8	+ 1/2	+7.8
A	COMPUTEST	13- 20	14 1/8	- 3/8	-2.5
O	CONSOL COMPUTER LTD.	8- 11	11	- 1/8	-1.1
A	DATA PRODUCTS CORP	6- 10	7 7/8	- 1/8	-1.5
O	DATA TECHNOLOGY	3- 9	7 3/4	- 3/8	-4.6
O	DIGITRONICS	4- 8	5 1/4	0	0.0
N	ELECTRONIC M & M	8- 15	14 1/8	+ 1/2	+3.6
O	FABRI-TEK	2- 4	3 5/8	+ 3/8	+11.5
O	FARRINGTON MFG	1- 3	1 1/2	- 1/2	-25.0
O	FOTO-MEM INC	2- 6	1 7/8	- 3/8	-16.6
O	INFOREX INC	31- 48	42 1/2	-4	-8.6
O	INFORMATION DISPLAYS	5- 8	6 1/4	- 1/8	-1.9
O	MANAGEMENT ASSIST	1- 2	1	0	0.0
A	MARSHALL INDUSTRIES	18- 27	23 3/4	+ 1/8	+0.5
A	MILGO ELECTRONICS	18- 26	22	- 1/4	-1.1
N	MOHAWK DATA SCI	23- 47	42 1/2	-2 1/2	-5.5
O	ON LINE SYSTEMS INC	7- 18	15 1/2	0	0.0
O	OPTICAL SCANNING	13- 18	13 3/4	-1 5/8	-10.5
O	PHOTON	7- 12	9 1/2	- 1/2	-5.0
O	PHOTO-MAGNETIC SYS.	1- 1	1	0	0.0
A	POTTER INSTRUMENT	17- 25	22 1/4	- 3/8	-1.6
O	PRECISION INST.	7- 14	10	0	0.0
O	RECOGNITION EQUIP	14- 26	21 1/2	-1 7/8	-8.0
O	REDCOR CORP.	5- 9	7	- 3/4	-9.6
N	SANDERS ASSOCIATES	13- 22	21 1/4	+2 1/2	+13.3
O	SCAN DATA	6- 11	6 3/4	- 7/8	-11.4
O	TALLY CORP.	11- 16	12 1/4	- 3/4	-5.7
N	TELEX	15- 22	20	- 5/8	-3.0
O	VIATRON	1- 4	7/8	0	0.0
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	14- 19	15 1/2	+ 1/4	+1.6
O	BALTIMORE BUS FORMS	6- 10	9	- 1/4	-2.7
A	BARRY WRIGHT	8- 13	10 1/4	- 5/8	-5.7
A	DATA DOCUMENTS	18- 29	25	+ 1/2	+2.0
O	DUPLEX PRODUCTS INC	8- 10	8 7/8	- 1/8	-1.3
N	ENNIS BUS. FORMS	10- 13	11 3/8	- 1/4	-2.1
O	GRAHAM MAGNETICS	9- 33	28 7/8	-1 7/8	-6.0
O	GRAPHIC CONTROLS	6- 13	12 1/4	- 7/8	-6.6
N	MEMOREX	54- 78	58 7/8	+ 1/8	+0.2
N	3M COMPANY	96-117	113 3/4	-1 1/2	-1.3
O	MOORE BUS. FORMS	37- 42	37 7/8	-1 7/8	-4.7
N	NASHUA CORP	29- 45	44 1/2	- 3/8	-0.8
O	REYNOLDS & REYNOLD	37- 52	44 1/2	-2 1/2	-5.3
O	STANDARD REGISTER	19- 23	21 1/4	+ 1/2	+2.4
O	TAB PRODUCTS CO	8- 15	15 3/8	+1 7/8	+13.8
N	UARCO	25- 33	32 5/8	+3 1/8	+10.5
A	WABASH MAGNETICS	8- 10	8 1/8	- 1/2	-5.7
N	WALLACE BUS FORMS	18- 26	21 5/8	-1 5/8	-6.9
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	105-138	135 3/4	-1 3/4	-1.2
N	COLLINS RADIO	14- 20	18 1/4	- 3/8	-2.0
N	CONTROL DATA CORP	48- 83	73	-2 1/2	-3.3
O	DATA GENERAL CORP	19- 45	42 1/2	-2 1/8	-4.7
N	DIGITAL EQUIPMENT	53- 83	79 1/2	+1 5/8	+2.0
N	ELECTRONIC ASSOC.	5- 9	8 5/8	+ 3/4	+9.5
A	ELECTRONIC ENGINEER.	5- 9	8 5/8	- 3/8	-4.1
N	FOXBORO	25- 42	41 1/2	- 1/8	-0.3
O	GENERAL AUTOMATION	12- 26	18 1/2	-2	-9.7
N	GENERAL ELECTRIC	94-124	120 1/2	-3 1/4	-2.6
N	HEWLETT-PACKARD CO	30- 45	40 1/8	+ 1/8	+0.3
N	HONEYWELL INC	83-115	107 7/8	-1 1/8	-1.0
N	IBM	310-364	351 3/4	-10 1/4	-2.8
O	INTERDATA INC	6- 11	10 1/2	0	0.0
N	NCR	38- 47	42 1/2	-1 1/8	-2.5
N	RCA	26- 40	38 1/2	- 3/4	-1.9
N	RAYTHEON CO	27- 46	44 1/4	-1	-2.2
O	SCI. CONTROL CORP.	1- 2	1 1/8	0	0.0
N	SPERRY RAND	25- 38	34 1/4	-1 5/8	-4.5
A	SYSTEMS ENG. LABS	14- 18	14 5/8	0	0.0
N	VARIAN ASSOCIATES	13- 18	16	- 1/8	-0.7
N	VICTOR COMPTOMETER	17- 27	22 1/2	+ 7/8	+4.0
N	WANG LABS.	29- 48	48 1/4	+ 3/4	+1.5
N	XEROX CORP	85-110	109	+1 7/8	+1.7
	LEASING COMPANIES				
A	BOOTHE COMPUTER	13- 27	24	-1	-4.0
O	BRESNAHAN COMP.	2- 4	2 3/4	- 1/2	-15.3
O	COMPUTER EXCHANGE	4- 9	5 1/2	+ 1/4	+4.7
A	COMPUTER INVSTRS GRP	8- 14	12 5/8	+ 5/8	+5.2
N	DATA PROC. F & G	11- 19	16 7/8	- 5/8	-3.5
O	DATRONIC RENTAL	2- 4	3 1/8	+ 1/8	+4.1
A	DEARBORN-STORM	24- 44	39 1/8	-1 5/8	-3.9
A	DIEBOLD COMP. LEAS.	5- 13	12 1/4	0	0.0
A	DPA, INC.	4- 8	7	- 3/8	-5.0
A	GRANITE MGT	9- 13	10 7/8	+ 5/8	+6.0
A	GREYHOUND COMPUTER	7- 11	10 3/8	+ 1/8	+1.2
N	LEASCO CORP	16- 23	21 1/8	- 3/8	-1.7
O	LECTRO MGT INC	2- 4	3 7/8	0	0.0
A	LEVIN-TOWNSEND CMP	5- 9	7 1/4	- 1/2	-6.4
O	LMC DATA, INC.	1- 1	7/8	0	0.0
O	NCC INDUSTRIES	3- 8	6 1/2	- 1/4	-3.7
O	SYSTEMS CAPITAL	3- 6	4 1/8	+ 5/8	+17.8
N	U.S. LEASING	16- 25	24 5/8	+1 1/8	+4.7

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

BOOTHE COMPUTER
Three Months Ended March 31

	1971	a1970
Shr Ernd	$.43	b$.35
Revenue	15,768,000	10,222,000
Earnings	823,000	663,000

a-Restated to include acquisitions. b-Adjusted for a 10% stock dividend in June, 1970.
Share earnings, assuming full dilution, were 39 cents in 1971 and 33 cents in 1970.

COMPUTER MACH. TECHNOLOGY
Six Months Ended Feb. 28

	1971	1970
Shr Ernd	.....	a$.07
Revenue	$623,588	1,173,362
Spec Cred	.....	10,256
Earnings (Loss)	(144,849)	b35,132

a-Based on income before special credit. b-Equal to 10 cents a share.

COMPUTER PROPERTY
Three Months Ended March 31

	1971	1970
Shr Ernd	$.18	$.13
Revenue	1,073,000	1,081,000
Earnings	118,000	87,000

SCANTLIN ELECTRONICS
Three Months Ended March 31

	1971	1970
Revenue	$1,750,000	$2,341,000
Loss	951,000	30,000

DIEBOLD
Three Months Ended March 31

	1971	1970
Shr Ernd	$.37	a$.75
Revenue	31,178,286	35,679,093
Earnings	1,164,489	2,284,982

a-Adjusted to reflect 3% stock dividend in January 1971.

MINNESOTA MINING & MFG.
Three Months Ended March 31

	1971	1970
Shr Ernd	$.84	$.78
Revenue	435,300,000	407,300,000
Earnings	47,000,000	43,500,000

ELECTRONIC DATA SYSTEMS
Three Months Ended March 31

	1971	1970
Shr Ernd	$.23	$.17
Revenue	20,049,005	14,500,284
Earnings	2,782,142	2,021,065
9 Mo Shr	.62	.42
Revenue	55,018,312	31,787,755
Earnings	7,415,371	4,931,671

BRADFORD COMPUTER & SYS.
Three Months Ended March 31

	1971	1970
aShr Ernd	$.13	b$.08
Revenue	2,650,634	1,962,210
Earnings	390,716	262,618

a-On a fully diluted basis. b-Adjusted to reflect a two-for-one stock split in May 1970.

XEROX
Three Months Ended March 31

	1971	1970
Shr Ernd	$.63	$.59
Revenue	450,300,000	402,600,000
Earnings	49,600,000	46,000,000

ITEL
Three Months Ended March 31

	a1971	a1970
Shr Ernd	$.30	$.02
Revenue	30,158,000	13,385,000
Earnings	2,128,000	121,000

a-Reflects the acquisition of ISS, in April 1971, on a pooling-of-interests basis.

DATA DOCUMENTS
Six Months Ended March 31

	1971	1970
Shr Ernd	$.72	$.96
Revenue	12,814,272	12,151,032
Earnings	337,337	448,906

DATRONIC RENTAL
Three Months Ended March 31

	1971	1970
Shr Ernd	$.06	$.06
Revenue	820,624	777,134
Earnings	39,566	45,145
9 Mo Shr	.26	.28
Revenue	2,388,078	2,287,112
Earnings	173,100	192,205

DIVERSIFIED COMPUTER & MAN.
Year Ended Dec. 31

	1970	a1969
Shr Ernd	$.06	$.06
Revenue	6,272,693	3,415,173
Earnings	88,151	66,159

a-Restated for acquisitions on a pooling-of-interests basis.

FOXBORO
Three Months Ended March 31

	1971	1970
Shr Ernd	$.36	$.14
Revenue	38,054,000	32,955,000
Earnings	1,503,000	602,000

TECHNICAL OPERATIONS
Three Months Ended March 27

	1971	1970
Shr Ernd	.....	$.01
Revenue	$2,282,000	3,175,000
Spec Chg	a123,000	.....
Earnings (Loss)	(310,000)	11,000

a-From cancellation of a lease.

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FACT 1

CODING When writing Cobol programs, MetaCOBOL has the most comprehensive Cobol macro facility available. One that provides: complete freedom to produce your own verbs (macros) and abbreviations; ADR-supplied macros including new Cobol verbs, abbreviations, analysis macros, plus Decision Table macros and Report Generator macros; and many more features.

FACT 2

TESTING When preparing test data, MetaCOBOL provides comprehensive data with a minimum of programmer effort. MetaCOBOL also performs Syntax Checking and can generate JCL statements.

FACT 3

STANDARDIZATION MetaCOBOL lets you *establish* and *enforce* your Cobol implementation and installation standards.

FACT 4

DEBUGGING When debugging Cobol programs, MetaCOBOL offers the most significant advances ever designed. These include all output in source language format. Selected trace on abnormal termination. Continued execution on abnormal termination. List of unexecuted paragraphs. And a frequency count of executed paragraphs.

FACT 5

EVALUATING When evaluating the performance of your Cobol program, MetaCOBOL is the only system that can perform this function at the source level and during execution.

FACT 6

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